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ABSTRACT

Follow-up comparisons were made of the intellectual, cognitive, academic and social performances of three groups of low-income children in kindergarten through fifth grade who differed in the amount of preschool education they had experienced. Children in Groups A and B had been enrolled in the University of Western Ontario Laboratory Preschool Program for 2 years and 1 year, respectively. Children in Group C had no preschool experience. The academic achievement of Groups A and B, as measured by forms of the Stanford Early School Achievement tests and teachers' reports, was superior to that of Group C. At all primary levels studied, children in Groups A and B maintained intellectual levels attained in preschool, with Group A scoring higher than Group B. Incidence of grade failure in Group C was three times that in Group A and more than twice that in Group B. Eighty-six percent of Group A, 83% of Group B and 60% of Group C were at grade level at the end of the study. In general, while children in Group C made cognitive gains in kindergarten and first grade, IQ differences between Groups A and C and between Groups B and C remained. Trends in the data suggested that the behavior of the children with two years of preschool experience was more acceptable to teachers than that of the other two groups. (Author/SS)

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THE FOLLOW-UP STUDY

PART 2 OF SECTION II OF THE FINAL REPORT

ON THE U.W.O. PRESCHOOL PROJECT

MARY J. WRIGHT

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Abstract

Comparisons were made of the performance of three groups of low-income children in the primary grades. Two groups consisted of children who had been in the University of Western Ontario Laboratory Preschool Program: (a) ones who had been enrolled as three year olds who attended for two years (Group A) and (b) ones who had been enrolled as four year olds and attended for one year (Group B). The third group consisted of children with no preschool experience (Group C). The total numbers of subjects (and the numbers in each group: A, B, and C respectively), studied during their first to fifth year in school were: First year (Kindergarten) 66 (24, 12, 30); second year 59 (24, 12, 23); third year 41 (22, 2, 17); fourth year 14 (7, 2, 5); fifth year 1 (in Group B).

Three kinds of performance were assessed: intellectual and cognitive competence, academic achievement, and social-personal adjustment.

It was found that the two groups (A and B) with preschool experience maintained the intellectual levels they had attained in preschool at all primary grade levels studied (i.e., there was no decline in Binet IQ) and they made further cognitive gains as measured by the Circus tests in Kindergarten. The group without preschool experience (Group C) made a significant IQ gain in Kindergarten, but it was not any greater than the gains made by Groups A and B. In both Kindergarten and Grade 1, Group C made substantial cognitive gains as measured by the Circus tests and by the end of Grade 1 was performing on the language measures just as well as Groups A and B. However, there was no closing of the gap between the IQs of Groups A and C or B and C and on the Circus tests, other than the language test, the performance of Groups A and B continued to be average but that of Group C continued to be below average.

The academic achievement of the two groups with preschool experience was

superior to that of the group with no preschool experience and Group A with two years performed somewhat better than Group B with only one year in preschool. These differences were reflected in their scores on the achievement tests, the teachers' judgments of their academic ability (although the teachers tended to underestimate the achievement of the Group B subjects as indicated by their test scores) and their pass/fail rates. The failure rate was three times as great in Group C as in Group A and more than twice as great in Group C as in Group B and at the end of the project only 60% of Group C were at grade level (with 10% 2 years below grade level) as compared with 86% of Group A and 83% of Group B.

The findings concerning the personal-social adjustment of the groups in school were equivocal, perhaps because all of the measures of this were subjective, i.e., based on teachers' ratings and appraisals. However, consistent trends in the data suggested that the behavior of the children with two years of preschool experience was more acceptable to teachers than that of the other two groups.

The findings strongly support the view that preschool education for children from low-income families can significantly reduce their risk of failing in the elementary school and reduce the cost of their education by eliminating their need for placement in special classes and reducing their need for remedial instruction. They also suggest that the assumptions made at Western about the needs of low-income children in a moderate sized city such as London were valid and that the program designed for them in the Laboratory Preschool was appropriate and therefore more successful than most compensatory preschool programs have been in achieving long-range as well as short-range goals in the intellectual, cognitive, and academic achievement areas.

FINAL REPORT ON THE U.W.O. PRESCHOOL PROJECT

Section II Program Evaluation

Part 2 The Follow-up Study

Preface

The University of Western Ontario Preschool Project began in the academic year 1973-74. Its purpose was to study the social, motivational and cognitive characteristics of Canadian, white, anglophone children from low-income families, by comparing them with children from middle- and upper-income families, to identify their special needs and to develop an early education program which was appropriate for them.

Initial findings suggested that the differences between the low- and the high-income children were greatest in the cognitive areas and smallest in the motivational and social areas and it was concluded that the greatest need of the low-income children was for cognitive stimulation. A program based on cognitive-developmental theory was therefore designed, which focused on the development of representational skills and conceptual intelligence and this program was successful in inducing, in both the low- and the high-income children, significant cognitive and also social gains.

The goals of the program were long-term as well as short-term. Therefore, the follow-up study, which is described in this report, was undertaken to determine the extent to which the low-income children maintained their preschool gains in the primary grades and were more successful in school than comparable children who had no preschool experience.

This report contains three chapters. The chapter form has been used in organizing the material because a book describing the total project is in preparation. These three chapters will form part of the book although the third chapter will be elaborated.

The book will be in two sections, the first section will provide a description of the preschool program and the research which influenced its development. The second section will report the evaluation of the program and it will have two parts.

The first will deal with the immediate impact of the program on the children when they were in preschool and the second will deal with the long-range impact after the children entered the primary grades (the follow-up study described in the present report).

The book will also include a report on the basic research which was done, as part of the project, to develop a new objective measure of social competence and to add to knowledge about the processes involved in the development of social abilities in preschool children.

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CHAPTER 1

The Follow Up: Objectives, Method, and Results at the Kindergarten Level

The primary purpose of the follow-up study was to assess the long-range effects of the UWO preschool program on the performance of the low-income children after they entered the primary grades. Would these children maintain the intellectual and cognitive gains they had made in the preschool? Would they adjust better to school, be better academic achievers and fail less often than comparable children who had no preschool experience? Would those who entered the preschool as three-year-olds and had two years in the program be more successful than those who entered as four-year-olds and had only one year in the program?

A variety of different types of preschool programs have been successful in inducing immediate IQ and other types of gains in low-income children (Weikart, 1967; Klaus & Gray, 1968, Bereiter, 1972) but these gains have appeared to be lost after one or two years in the primary grades (Bronfenbrenner, 1974). Over time the size of the initial differences between the test scores of the preschool graduates and their controls have gradually diminished, due in part to a reduction in the performance levels attained by the preschool graduates, but also to gains made by the control subjects after they entered the kindergarten. However, in several recent follow-up studies (Palmer, 1976; Weikart et al., 1978) it has been found that after six or seven years in the elementary school significantly more of those with preschool experience than their controls were in the appropriate grade for their age. Such findings have been interpreted by some as "sleeper" effects and it has been suggested that the benefits of preschool experience are not likely to show up when children are learning basic skills in the primary grades, but only when they meet greater cognitive challenges later on. However,

if the controls "failed" a year more frequently than those from the preschools this probably began even at the primary levels.

Currently in Canada, there is a growing public demand for universally available pre-kindergarten education in the public schools. If this demand is met, at what age should children be enrolled? There is some evidence that youngsters who start preschool as three-year-olds make greater immediate intellectual gains and maintain these gains better than children who start preschool as four-year-olds or children who start school in kindergarten as five-year-olds (Beller, 1972). Although the maintenance of the gains may be a function of the amount of preschool experience, rather than the age of preschool entrance, this finding, if verified, would have important practical implications. On the other hand if it were not verified, that is if one year of preschool experience which starts when the child is a four-year-old is as effective, in the long run, as two years of preschool, then the practice, common in most municipalities, of not admitting children until they are four-year-olds would have some research support. Because of the practical importance of this issue, an attempt was made to assess the differential long range effects of two years of preschool starting at age three, and one year of preschool starting at age four on later academic achievement.

Although the focus in the follow-up study was on intellectual and cognitive competence and academic achievement an attempt was also made to assess the children's personal and social adjustment in the school setting and their attitudes toward teachers and school work.

METHOD

Subjects

Preschool graduates (PGs). All of the children from low-income families

(but not those from high-income families) who were studied in the preschool and were subsequently enrolled in the London public and separate schools, or the Middlesex County public schools, were followed up. They will be referred to as preschool graduates (PGs). In all, there were 36 PGs, 24 who started preschool as three-year-olds and attended for two years (Group A) and 12 who started preschool as four-year-olds and attended for only one year (Group B).

Control subjects. Thirty control subjects were obtained. These constituted a third group (Group C). They were children from low-income families who had had no preschool or day nursery experience and were enrolled in an early education program for the first time as five-year-olds in kindergarten. These subjects were selected on the basis of age, sex, SES and test scores to equate Group C as closely as possible with the two PG groups, A and B.

Selection procedure for the control subjects. The primary selection criterion was the Preschool Inventory Percentile Score. It was chosen for this purpose because the authors of the test claim that it reflects the degree of disadvantage a child has suffered. The Stanford Binet Intelligence test was also used as a supplementary criterion measure. The control subjects selected were ones who obtained scores on these measures, at entry into kindergarten, which were comparable to the scores obtained on them by the PGs when they were first enrolled in the preschool. The tests were administered to the control subjects, as they had been to the preschoolers, no sooner than six weeks after they had been enrolled for the first time in school.

Suitable control subjects were extremely difficult to obtain. This was primarily because the school authorities were not permitted, for ethical reasons, to reveal any information about the socio-economic status of families. They could provide information only about whether or not children had had any

preschool experience. The initial intention was to select the controls from only those schools in which the PGs were enrolled, but by the second year, for two reasons, this plan was abandoned. First it was not yielding enough subjects. Second, the PGs were being enrolled in so many different schools and were changing schools so frequently that to avoid any possible school-of-enrollment effects it was decided that the controls should also be enrolled in as many schools as were the PGs. To increase the likelihood of finding low-income families, schools located near subsidized housing were included. Also the cooperation of public health officers and nurses was finally obtained and these provided the names of a number of potential subjects.

Before the pre-testing was done, parental permissions were obtained. A letter (see letter #1 Appendix A) explaining the project and seeking permission to study a child was sent out to some 200 or more families. About two thirds replied and agreed to let their child participate. Thus approximately 125 children were pre-tested. After the testing, a preliminary selection of subjects was made based on age, sex, and test scores. Then the procedure for determining the socio-economic status of the families (the final selection criterion) was initiated. SES was judged (as it was for the PGs) on the basis of information obtained from the parents during semi-formal, scheduled interviews and home visits.[1] In these interviews rapport was established with the families, and the interviewer also made sure the child had not had any previous preschool experience and had no special disability which would make him/her unsuitable for the project. After the SES index of the families was estimated the final selection of control subjects was made and the families of those who had not been selected for further study were notified (see letter #3, Appendix A).

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[1] A copy of the letter requesting an interview (letter #2) is provided in Appendix A along with a copy of the Parent Interview Form which was employed.

Schools attended and school changes

All, but one, of the control subjects were enrolled in the public schools, but a quarter of the PGs were enrolled in the separate (Roman Catholic) schools. In some schools there were both PGs and controls, but in others there were only PGs, or only controls. Many of the families were highly mobile and their children changed schools frequently. The following provides data on these variables for the last two years of the project.

In 1977-78 when there were 36 PGs and 24 controls in the project, these 60 children were in 28 different schools. In eight there were both PGs and controls, but in 13 there were only PGs and in seven only controls. During that year 30% of the PGs and 4% of the controls changed schools once or more. In 1978-79 when there were 34 PGs and 28 controls in the project, these 62 children were in 35 different schools. In nine there were both PGs and controls, but in 15 there were only PGs and in 11 only controls. During this year 24% of the PGs and 32% of the controls changed schools once or more.

General description of the total sample

The subjects in each group are described individually by age, sex, SES index, Preschool Inventory Percentile Score and Binet IQ (when available) at entry into the project (at the preschool or Kindergarten level) in the appendix (see Appendix B). A summary description of the groups studied at the kindergarten level is presented in Table 1.

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Insert Table 1 about here

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SES. In general the controls appeared to be, if anything, somewhat less disadvantaged than the PGs. Only 40% of them were from single parent families as compared with 50% in Group A and 80% in Group B. However, the

Table 1

Description of the Groups studied at the Kindergarten level by sex, SES index, age at entrance to Kindergarten, and Preschool Inventory Percentile score and Binet IQ at entrance into the project

Variable	Group A (n = 24)	Group B (n = 12)	Group C (n = 30)
Sex			
Males	11 (45.8%)	7 (58.3%)	14 (46.6%)
Females	13 (54.2%)	5 (41.7%)	16 (53.3%)
SES index			
X	30.5	30.1	32.8
SD	3.9	5.7	7.5
Range	27.8 - 44.2	27.3 - 47.6	27.0 - 51.7
Age at entering Kindergarten in months			
X	63.6	63.3	62.3
SD	3.0	3.8	3.1
Range	60-69	58-69	58-69
Preschool Inventory Percentile score at "entry into the project"[1]			
X	20.9	61.0	59.3
SD	27.0	31.8	25.4
Range	0-97	1-95	11-91
Stanford Binet IQ[2] at "entry into the project"[1]			
X	87.4[2]	93.2[2]	90.5
SD	11.7	11.8	11.8
Range	68-112	71-106	60-108

Note 1. "entry into the project" was at approximately age 3, 4 and 5 for Groups A, B and C respectively.

Note 2. The mean Binet IQs for Groups A and B are based on 16 (of the 24) and 11 (of the 12) subjects respectively, because the Binet was not included in the test battery in the first year of the project.

mean SES index (Blishen, 1967) of Group C (32.8, SD 7.5) which was based on the usual occupation of the heads of the families (mother in single, father in intact), if or when they were employed, was not significantly higher than the means of the other two groups (30.5, SD 3.9 and 30.1, SD 5.7 for A and B respectively). The educational level that the family heads claimed they had achieved was slightly higher in Group B than in the other two groups with Groups A and C being about equal. The percentage in each group claiming attainment at each of three levels was for A, B, and C respectively as follows:

Above Grade 10:	12.5	16.6	17.2
Grade 9 or 10:	50.0	66.7	48.3
Grade 8 or below:	37.5	16.7	34.5

Ethnicity. Most, but not all of the children were White Caucasians. There were four native (Indian) subjects in Group A (3 girls, 1 boy), one negroid girl in Group B and one native (Indian) girl and one negroid boy in Group C.

Pre-test scores. The initial mean Preschool Inventory Percentile scores of the groups suggested that Group A was more disadvantaged than the other two groups. Group A's score (20.9) was signiricantly lower than Group B's (61.0) or Group C's (59.3) score $p < .01$. However, their initial mean IQ scores (87.4, 93.2, 90.5 for A, B and C respectively) were not significantly different.

For sex, Groups A and C were fairly well balanced with slightly more than half of the subjects in each being girls (54.2% in Group A and 53.3% in Group C) but in Group B there were proportionately more boys than girls (only 41.7% were girls).

For age, the groups were satisfactorily equated. Their mean age at entry into Kindergarten was for A, B, and C respectively 63.6, 63.3, and 62.3 months.

Number of post-kindergarten years studied

All of the 66 subjects described above were followed up for one year after entry into Kindergarten, but successively fewer were studied at each of the higher grade levels. This was because the preschool subjects entered Kindergarten by cohort in five consecutive school years and new control subjects were also selected in each of these years. Thus, for example, only the first cohorts in Groups A and C had completed their fourth year in school by the end of the project. There was also some attrition in each of the groups over time. The numbers of subjects studied during their first to fifth year in school is shown by group and assessment time in Table 2.

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Insert Table 2 about here

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Because both the size and constitution of the samples of each group studied beyond Kindergarten changed by year in school, they will be described in greater detail later, just prior to the presentation of the results at each of the higher grade levels.

Assessment instruments

An attempt was made to assess: (a) intellectual ability, cognitive competence and cognitive styles, (b) academic achievement and (c) personal-social adjustment in school.

Intellectual and cognitive competence measures. The Stanford Binet Intelligence Scale was used at all levels. In addition, at the kindergarten level, the Preschool Inventory, two Circus tests, (Form A) "Say and Tell" and "Think it Through" and the Kansas Reflection-Impulsivity Scale for Preschoolers (KRISP) were employed and, at the Grade 1 level, three Circus

Table 2

The number of subjects studied during their first to fifth year after entry into Kindergarten

GROUP	FIRST (Kindergarten)		SECOND (Grade 1)		THIRD (Grade 2 or below)		FOURTH (Grade 3 or below)		FIFTH (Grade 4)	
	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring
A	24	24	24	24	22	11*	7	7	0	0
B	12	12	12	7*	2	2	2	1	1	1
C	30	30	23	23	17	17	5	5	0	0
Total	66	66	59	54	41	30	14	13	1	1

*Note. In the termination year of the project, fall (but not spring) tests were given to cohort 3 of Group A (n = 11) and cohort 4 of Group B (n = 5) but not to cohort 5 of Group C.

tests (Form B), "Say and Tell", "Think it Through", and "How Much and How Many" and the KRISP were used.

Academic achievement. This was assessed in two ways (a) through testing and (b) through teacher reports of progress and promotion. The tests used were the Stanford Early School Achievement test Level 1 (first year in school, i.e., kindergarten level), the Stanford Early School Achievement test Level II (second year in school), the Stanford Achievement Test Primary I Battery (fall) and Primary II Battery (spring) (third year in school) and the Stanford Achievement Test, Primary II Battery (fourth year in school). The report form used by the teachers was developed by the author. A copy of it is appended (see Appendix C) It was called the School Adjustment Report and included open-ended questions which permitted the teacher to comment freely on the child's behavior and abilities.

Personal-social adjustment. This was measured in part by teachers' responses to questions on the School Adjustment Report referred to above and by scores on a Behavior Rating Scale. A copy of the Behavior Rating Scale is also included in the appendix (see Appendix D). It is a 50-item scale which assesses the extent to which children are "like" children who display behavior which has been found to be related to classroom achievement. Each child is rated on each item as "not at all like", "very little like", "somewhat like" or "very much like" on each item. The first 20 items of the scale were taken from a Behavior Inventory developed for assessing the outcome of Head Start programs (Hess et al., 1966). Twenty-one of the next 30 items were taken from the Devereux Elementary School Behavior Rating Scale (Spivak & Swift, 1967). Nine additional items, made up by the present investigator, were included to obtain additional information.

Procedure

There were two assessment periods each year, one in the fall and the other

in the spring. At the Kindergarten level all tests were given in both the fall and the spring. However, at the post-Kindergarten levels only the academic achievement tests (and the KRISP in Grade 1) were given at both the fall and spring assessment times. At these higher levels the Binet was given only in the fall, and at the Grade 1 level the Circus tests were given only in the spring. The teachers completed the School Adjustment Report and the Behavior Rating Scale once during the school year, i.e., in the late spring.

At the Kindergarten level the Preschool Inventory was given first (in October), no sooner than six weeks after the children were enrolled in school, and the Binet was administered approximately one week later. The rest of the tests were given in November in no fixed order. However, in the spring when tests given in the fall were readministered (May-June) the children were tested in the same order as they had been tested in the fall. At the higher grade levels the children were also tested in the same order in the spring as in the fall.

Until the final year of the project there were four testers, one of whom gave only the initial preschool inventories. The other three did all the rest of the testing, but administered different tests at each assessment time to avoid expectancy effects. In the final year a professional psychologist, who had no knowledge about the children or the project, was hired to administer the Stanford Binet to 16 subjects: This was done as a special reliability check on the scores. The children tested were those in the last cohort of each of the two PG groups (A and B).

RESULTS: First year in school (Kindergarten)

Intellectual and cognitive competence

The mean scores of the three groups at the beginning and end of kindergarten on four of the measures used to assess intelligence and cognitive competence (Preschool Inventory Percentile Scores, Binet IQs, Circus "Say and

Tell" functional language scores, and Circus "Think it Through" total scores are presented in Table 3.

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Insert Table 3 about here

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The data obtained with these tests were subjected to a series of 3 (Group) x 2 (Time: fall, spring) Analyses of Variance (ANOVAs). When significant effects were found post hoc analyses were done using Dunn's Multiple Comparisons test (Kirk, 1968).

Preschool Inventory. There was a main Group effect, F (2,61) = 11.9, $p < .01$. In the fall the two PG groups (A & B) were not significantly different but both of these groups scored higher than Group C $p < .01$.

From fall to spring the two PG groups (A & B) maintained their end-of-preschool performance levels, but made no further significant gains and Group C gained more than the two PG groups, (Group x Time interaction, F (2,61) = 3.9, $p < .05$).

In the spring the differences between the PG groups and the Control group were reduced, but Group A still scored higher than Group C ($p < .05$).

Binet IQ. There was a main Group effect, F (2,61) = 10.4, $p < .01$. In the fall the scores of the two PG groups (A & B) were not significantly different, but both of these groups scored higher than Group C $p < .01$.

From fall to spring all three groups made significant gains, F (1,61) = 17.0, $p < .01$ and there were no significant differences among the groups in the size of these gains.

In the spring, both of the PG groups still scored higher than Group C ($p < .05$).

Table 3

Mean and (SD) scores on four measures of intellectual and cognitive ability for the groups at the Kindergarten level by assessment time

	Group A n = 24				Group B n = 12				Group C n = 30			
	Fall		Spring		Fall		Spring		Fall		Spring	
	X	(SD)	X	(SD)	X	(SD)	X	(SD)	X	(SD)	X	(SD)
Preschool Inventory Percentile Score	87.7	(17.6)	87.2	(17.2)	83.3	(20.6)	89.8	(9.6)	59.3	(25.4)	72.3	(16.6)
Binet IQ	102.7	(10.2)	104.4	(11.3)	104.3	(9.0)	108.4	(8.3)	90.5	(11.8)	95.6	(11.6)
Circus "Say and Tell" Form A Functional Language	55.6	(8.2)	57.7	(8.5)	50.3	(16.")	56.4	(10.6)	43.3	(6.9)	50.1	(8.6)
Circus "Think It Through" Total scores	21.7	(3.3)	23.7	(3.8)	19.8	(5.2)	24.7	(4.5)	17.4	(4.9)	19.8	(4.3)

Note. US National means and (SDs) for the Circus tests at the Kindergarten level:
"Say and Tell" functional language 51.0 (13.7).
"Think It Through" total score 22.2 (5.4).

"Say and Tell" functional language. There was a main Group effect, F (2,61) = 85.4, $p < .01$. In the fall the scores of the two PG groups (A & B) were not significantly different but Group A (although not Group B) scored higher than Group C $p < .01$.

From fall to spring all three groups made significant gains, F (1,61) = 28.6, $p < .01$.

In the spring, there were no significant differences among the three groups. However, it should be noted, that the two PG groups were both performing at a level equal to, or above, the US National mean, but Group C was performing below that level.

Think it Through total scores. There was a main Group effect, F (2,61) = 10.35, $p < .01$. In the fall the scores of the two PG groups (A & B) were not significantly different but Group A (although not Group B) scored higher than Group C ($p < .01$).

From fall to spring all three groups gained (F (1,61) = 29.4, $p < .01$) but the gains were greater in Group B ($p < .01$) and Group C ($p < .05$) than in Group A.

In the spring both of the PG groups scored higher than Group C (Group A, $p < .01$; Group B, $p < .05$). It should be noted also that the two PG groups both scored at a level equal to or above the US National mean, but Group C scored below that level.

Kansas Reflection-Impulsivity Scale for Preschoolers (KRISP). The number of subjects in each group who were classified, by their performance on this measure, as reflective, impulsive (or otherwise) at each assessment time are

shown in Table 4. The classifications reflective, average or fast-accurate

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Insert Table 4 about here

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represent satisfactory performance.

In the fall 65% of Group A and 92% of Group B, but only 42% of Group C performed satisfactorily (as defined above) on this test.

In the spring 87% of Group A, 83% of Group B, but only 47% of Group C performed satisfactorily.

At both assessment times a larger proportion of the Control than the PG subjects performed impulsively (were fast and inaccurate).

Summary of Results on Intellectual and Cognitive Competence

First, comparisons of the two PG groups A & B revealed the following:

1) At the beginning of the year the scores of these two groups were not significantly different on any of the measures.
2) From fall to spring, both groups maintained their preschool gains and on three measures (the Binet, "Say and Tell" functional language, and "Think it Through") made further gains. Group B made greater gains than Group A on "Think it Through" and somewhat greater gains on "Say and Tell" functional language, but not on the Binet.
3) At the end of the year the scores of the two PG groups were still not significantly different.

Table 4

Percentage of subjects in each KRISP category by group and assessment time at the Kindergarten level

	Group A		Group B		Group C	
	Fall	Spring	Fall	Spring	Fall	Spring
Reflective (slow-accurate)	17.4	21.7	8.3	33.3	3.3	3.3
Average	30.4	30.4	66.7	25.0	26.7	26.7
Fast Accurate	17.4	34.8	16.7	25.0	10.0	16.7
Impulsive (fast-inaccurate)	30.4	4.3	8.3	8.3	56.7	36.6
Slow-Inaccurate	4.3	8.7	0	8.3	3.3	16.7

Second, comparisons of each of the two PG groups (A & B) with the Control Group (Group C) revealed the following:

1) At the beginning of the year, Group A performed (on all five measures) and Group B (on three measures: Preschool Inventory, Binet, and KRISP) significantly better than Group C.
2) From fall to spring Group C gained, on the Preschool Inventory, more than either of the two PG groups and gained more than Group A (but not Group B) on "Think it Through". However, there were no significant differences among the groups in the size of the gains made on the Binet or "Say and Tell" Functional language.
3) At the end of the year, both of the PG groups scored higher than Group C on the Binet and "Think it Through" and both performed more satisfactorily on the KRISP. Also, Group A (although not Group B) scored significantly higher than Group C on the Preschool Inventory. By this time, however, the differences among the groups on "Say and Tell" Functional language were not large enough to be significant.
4) At both the beginning and end of the year, the two PG groups performed on all measures at an average or above average level, but the performance of Group C was low average or below average on all of the measures.

Academic Achievement

The Stanford Early School Achievement Test, Level 1 is a battery of

tests. It yields 4 sub-test scores (Environment, Mathematics, Letters and Sounds, and Aural Comprehension) as well as a total score. The mean scores of the three groups on these measures at each of the assessment times are presented in Table 5.

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Insert Table 5 about here

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The data obtained with these measures were subjected to a series of 3 (Group) x 2 (Time) ANOVAs followed by post hoc analyses where indicated.

Environment. In the fall there was no significant difference between the scores of the two PG groups (A and B) but both of these groups scored higher than Group C, F (2,60) = 11.54, $p < .01$, (A, $p < .01$; B, $p < .05$). From fall to spring, significant gains were made F (1,60) = 55.6, $p < .01$ by Group A ($p < .05$) and Group C ($p < .01$) but not Group B. In the spring there was still no difference between Groups A and B, but Group A (although not Group B) scored significantly higher than Group C ($p < .05$).

Mathematics. In the fall the scores of the two PG groups (A and B) were not significantly different, but both of these groups scored higher than Group C, F (2,60) = 10.6, $p < .01$ (A, $p < .01$; B, $p < .05$). From fall to spring all three groups made significant gains, F (1,60) = 60.3, $p < .01$. In the spring there was still no significant difference between Groups A and B, but Group B (although not Group A) scored significantly higher than Group C ($p < .01$).

Letters and Sounds. In the fall the differences among the three groups were not large enough to be significant. From fall to spring all three groups made significant gains, F (1,60) = 86.8, $p < .01$. In the spring there were

Table 5

Mean and (SD) Stanford Early School Achievement, Level I scores by group and testing time at the Kindergarten level

Test	Group A		Group B		Group C	
	Fall (n = 23)	Spring (n = 23)	Fall (n = 11)	Spring (n = 11)	Fall (n = 30)	Spring (n = 30)
Environment	30.2 (5.7)	33.2 (4.2)	28.8 (5.7)	31.4 (4.7)	22.8 (4.9)	28.5 (5.4)
Mathematics	16.2 (4.5)	18.2 (4.5)	16.1 (4.2)	20.3 (3.6)	11.2 (3.5)	15.0 (4.5)
Letters and Sounds	14.9 (4.9)	19.0 (5.2)	15.9 (4.4)	20.7 (4.1)	11.6 (4.8)	16.5 (5.6)
Aural Comprehension	17.9 (4.0)	20.6 (3.2)	16.5 (5.4)	18.8 (5.1)	13.3 (3.6)	16.4 (4.7)
Total Score	79.0 (15.9)	91.0 (13.7)	77.3 (15.8)	91.2 (14.9)	58.2 (12.4)	76.4 (16.4)

Note

Range of scores in Stanine 5 (average performance based on U.S. standardization data)

Beginning Kindergarten (Fall)		End of Kindergarten (Spring)	
Environment	26-29	Environment	33-35
Mathematics	12-13	Mathematics	19-21
Letters and Sounds	10-11	Letters and Sounds	17-20
Aural Comprehension	15-17	Aural Comprehension	19-21
Total Score	63-73	Total Score	87-96

still no significant differences among the groups.

Aural Comprehension. In the fall the scores of the two PG groups (A and B) were not significantly different, but Group A (although not Group B) scored significantly higher than Group C, F (2,60) = 98.5, $p < .01$ (A > C, $p < .01$). From fall to spring significant gains were made, F (1,60) = 29.5, $p < .01$ by Group A ($p < .01$) and Group C ($p < .01$) but not Group B. In the spring there was still no significant difference between Groups A and B, but Group A (and not Group B) again scored significantly higher than Group C ($p < .01$).

Total Score. In the fall the total scores of the two PG groups (A and B) were not significantly different and both of these groups scored higher than Group C, F (2,60) = 12.3, $p < .01$ (A > C, $p < .01$; B > C, $p < .01$). From fall to spring all three groups made significant gains, F (1,60) = 14.8, $p < .01$. In the spring there was still no significant difference between Groups A and B, and both of these groups scored higher than Group C (A, $p < .01$; B, $p < .05$).

Summary of Results on the Stanford Early School Achievement Test Level I

First, comparisons of the two PG groups (A and B) revealed the following:

1) At the beginning of the year there were no significant differences between these groups by sub-test or total score.
2) From fall to spring significant gains were made by Group A on all four sub-tests and the total score and by Group B on two sub-tests (Mathematics and Letters and Sounds) and the total score.
3) At the end of of the year there were still no significant differences between the scores of these two groups by sub-test or total score.

Second, comparisons of each of the two PG groups (A and B) with the

Control Group (Group C) revealed the following:

1) At the beginning of the year both of the PG groups obtained higher total scores than Group C. However, the sub-test score differences between them and Group C varied by sub-test and PG group. The differences were greatest on Environment and Mathematics, with both Groups A and B scoring higher than Group C, less on Aural Comprehension, with Group A (but not Group B) scoring higher than Group C, and least on Letters and Sounds on which the differences among the three groups were not large enough to be significant.

2) From fall to spring Group C (like Group A) made significant gains on all four sub-tests and the total score, but Group B made significant gains on only two of the sub-tests and the total score.

3) At the end of the year both of the PG groups again obtained higher total scores than Group C, but the sub-test score differences between them and Group C still varied by sub-test and PG group. Group A (but not Group B) scored higher than Group C on Environment and Aural Comprehension, but Group B (and not Group A) scored higher than Group C on Mathematics and there were (as in the fall) no significant differences among the three groups on Letters and Sounds.

4) The overall performance of the two PG groups, when judged against US norms, was above average, or average, in both the fall and the spring, but the performance of the Control group was below average at both assessment times.

Teacher judgments of academic achievement. The School Adjustment Reports were interpreted and analyzed by the principal investigator. To check the reliability of the interpretations, twenty of the reports (randomly selected from among the three groups) were scored independently by a second investigator. The agreement of the two investigators was 100%.

The percentages of subjects assigned to each judgment category in the School Adjustment Report are presented by group in Table 6. No attempt was made to assess

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Insert Table 6 about here

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the statistical reliability of the apparent differences among the groups which this subjective measure revealed. The findings reported below should, therefore, be interpreted with caution. The results on academic competence were as follows:

1) Academic Competence (item 9). A larger percentage of the subjects in Group A (39%) than Group B (18%) or Group C (3%) were judged to be above average in academic competence and a smaller percentage of the subjects in Group A (13%) than Group B (27%) or Group C (41%) were judged to be below average.

2) Preparation for School (item 3). A larger percentage of the subjects in Group A (35%) than Group B (9%) or Group C (10%) were judged to have had above average preparation for kindergarten work. Although this comparison suggested that Group B was no better prepared for school than Group C, a smaller percentage of the subjects in Group B (27%) than Group C (53%) were considered poorly prepared. Only 13% of the Group A subjects were judged to be poorly prepared.

Table 6

Percentage of subjects assigned to each judgment category of the School Adjustment Report by Group at the Kindergarten level

1. How well has this child adjusted to your class?

Group A	17.4	above average	78.3	average	4.3 below average
Group B	9.1	above average	72.7	average	18.2 below average
Group C	26.7	above average	53.3	average	20.0 below average

2. Are this child's attitudes toward school, teachers, and school work positive?

Group A	21.7	above average	73.9	average	4.3 below average
Group B	18.2	above average	81.8	average	0 below average
Controls	16.7	above average	73.3	average	10.3 below average

3. Was this child well prepared academically for the work of your class?

Group A	34.8	above average	52.2	average	13.0 below average
Group B	9.1	above average	63.6	average	27.3 below average
Group C	10.0	above average	36.7	average	53.3 below average

4. How well has this child progressed academically during the current year?

Group A	26.1	above average	60.9	average	13.0 below average
Group B	0	above average	72.7	average	27.3 below average
Controls	10.3	above average	69.0	average	20.7 below average

5. Did this child need remedial help?

Group A	91.3	No	8.7	Yes
Group B	72.7	No	27.3	Yes
Group C	73.3	No	25.7	Yes

6. Did this child attend school regularly?

Group A	87.0	Yes	13.0	No
Group B	90.9	Yes	9.1	No
Group C	86.7	Yes	13.3	No

7. Was this child promoted to the next grade?

Group A	100.0	Yes	0	No
Group B	100.0	Yes	0	No
Group C	100.0	Yes	0	No

8. What is your general appraisal of this child's personal and social competence?

Group A	73.9	satisfactory	17.4	some concern	8.7 poor
Group B	36.4	satisfactory	54.5	some concern	9.1 poor
Group C	58.6	satisfactory	37.9	some concern	3.4 poor

9. What is your general appraisal of this child's academic competence?

Group A	39.1	above average	47.8	average	13.0 below average
Group B	18.2	above average	54.5	average	27.3 below average
Group C	3.4	above average	55.2	average	41.4 below average

Notes

Group A: Complete reports were obtained on only 23 of the 24 subjects, but all 24 were promoted.
Group B: Complete reports were obtained on only 11 of the 12 subjects, but all 12 were promoted.
Group C: Complete reports were obtained on all 30 subjects.

3) Academic progress during the year (item 4). A larger percentage of the subjects in Group A (26%) than Group B (0%) or Group C (10%) were judged to have made above average progress during the year and a smaller percentage of the subjects in Group A (13%) than Group B (27%) or Group C (21%) were judged to have made below average progress. Note that in these comparisons, Group B appeared to be progressing no more successfully than Group C.

4) Special Instruction (item 5). A smaller percentage of the subjects in Group A (9%) than Group B (27%) or Group C (26%) were given remedial help or special instruction. This finding was consistent with the one reported immediately above and suggested that Group B was judged to need as much special help as Group C.

5) Promotion (item 7). The decision to promote at this level did not differentiate the groups. The reports indicated that all subjects would be promoted to a grade 1 class.

In summary, the teachers' judgments of the children favoured Group A (which had two years of preschool experience) over Group B (which had only one year in preschool) on all items dealing with academic achievement. Furthermore, although they judged Group B to be somewhat more capable academically than Group C and somewhat better prepared for school, they considered the progress made by this group during the year to be no better than that made by Group C. These findings were puzzling because they were inconsistent with the results obtained with the Stanford achievement tests which suggested that Group B's academic performance was, more often than not, as satisfactory as that of Group A and clearly superior to that of Group C.

Personal and Social Adjustment

The School Adjustment Reports included questions about the social and personal adjustment of the children. The percentages of subjects in each group assigned to each judgment category in the personal and social areas were presented above in Table 6. The findings were as follows:

1) Personal and Social Competence (item 8). A larger percentage of the subjects in Group A (74%) than in Group B (36%) or Group C (59%) were considered to be "well-adjusted" personally and socially. Note that Group B was considered less "well-adjusted" than Group C. The teachers expressed concern about, or reported "poor" adjustment for 64% of Group B, 41% of Group C and only 26% of Group A.

2) Adjustment to the Classroom (item 1). Only 17% of the subjects in Group A and only 9% of Group B as compared with 27% of Group C were said to have made "above average" adjustments to the classroom. However, a smaller proportion of Group A (4%) than Group B (18%) or Group C (20%) were said to have made below average adjustments.

3) Attitude to School, Teachers, and School Work (item 2). The groups were not judged differently on this item and it is noteworthy that none of the Group B subjects' attitudes were considered below average.

The Behavior Rating Scale. The mean scores of the groups on each dimension assessed by this measure are presented in Table 7. The findings were as follows:

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Insert Table 7 about here

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Table 7

Mean and (SD) Behavior Rating Scale Scores at the End of Kindergarten by Group

	Dimension	Group A (n = 23)	Group B (n = 11)	Group C (n = 30)
1.	Aggression[1]	12.6 (3.1)	11.9 (3.7)	13.0 (2.8)
2.	Verbal-Social Interaction	11.9 (3.1)	10.8 (3.9)	11.8 (3.7)
3.	Timidity[1]	12.7 (2.6)	11.0 (3.8)	11.6 (3.6)
4.	Independence	12.3 (2.3)	10.9 (3.6)	10.7 (2.7)
5.	Achievement Motivation	12.2 (2.8)	10.7 (3.0)	10.9 (3.0)
6.	Impatience[1]	10.9 (3.4)	10.6 (3.2)	10.6 (2.9)
7.	External Reliance[1]	14.1 (2.8)	13.0 (3.1)	11.2 (3.1)
8.	Inattentive-Withdrawn[1]	12.6 (2.3)	9.9 (4.4)	10.7 (3.2)
9.	Creative-Initiative	10.3 (2.9)	8.8 (4.1)	8.9 (3.4)
10.	Need for Closeness	11.8 (3.0)	10.5 (2.8)	11.4 (3.3)
	Total (all dimensions)	121.2 (18.5)	108.1 (28.4)	110.9 (22.3)
	Ambition[2]	37.1 (6.2)	32.6 (9.4)	33.2 (8.2)

Notes

1. For Agression, Timidity, Impatience, External Reliance, Inattentive-Withdrawn higher scores indicate less of the behavior.

2. "Ambition" is a combined score for Timidity, Independence and Achievement Motivation.

1) Scores on only one dimension, External Reliance, significantly differentiated both of the PG groups (A and B) from Group C, F (2,61) = 6.1, $p < .01$. The PG's were rated as less dependent on external direction (looked less to see what others were doing, relied less on teacher for direction about how to do things, needed less direction to proceed successfully, had less difficulty deciding what to do when given choices, were less swayed by the opinions of others) than were the Group C subjects.

2) On the dimension Inattentive-withdrawn, the difference between Group A and both of the other two groups approached significance, F (2,61) = 3.5, $p < .04$. Group A was rated somewhat less inattentive and withdrawn than the other two groups. (Attended to teacher explanation longer, seemed to pay attention to teacher, i.e., looked elsewhere less often, was less often "not with it", was less difficult to reach, i.e., less preoccupied with own thoughts.)

3) On the other dimensions assessed, the trends generally favoured Group A over the other two groups, but the differences among them were not large enough to be significant.

In summary, the teachers' judgments of the personal adjustment and social behavior of the groups were generally consistent with their judgments of their academic ability and progress. By and large they tended to favour Group A over the other two groups, but in the personal-social area, also tended to favour Group C over Group B. It appeared that only one year in preschool (as opposed to two years) may have developed tendencies in the children, such as "internal" as opposed to "external" reliance which, when unaccompanied by other kinds of

desirable behavior, were unacceptable to the teachers. The teachers' reactions to such tendencies may have, to some extent, generalized and affected their judgments of the children's academic ability. If so, this might account for why their assessments of Group B's academic ability and progress relative to that of either Group A or Group C, were inconsistent with Group B's actual performance on the achievement tests.

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APPENDICES

A. Letter # 1 — Request for permission to study.

Letter # 2 — Request for interview with families of children tentatively selected for project. Parent Interview Form.

Letter # 3 — Informs families of children not selected for project.

B. Description of each individual subject in each group by age, sex, SES index, Preschool Inventory Percentile Score and Binet IQ at entry into the project.

C. School Adjustment Report.

D. Behavior Rating Scale.

The University of Western Ontario

Faculty of Social Science
Department of Psychology
London, Canada N6A 5C2

I am writing to ask if you would give us permission to include your child in a study of the effects of nursery school experience on the performance of young children in kindergarten and the primary grades.

Children who go to nursery schools learn things which often help them do well at school, at least in the first few years. However, children who have not had the opportunity to go to a preschool, often catch up to the nursery school children quite quickly and in the long run appear to do just as well.

We are studying the progress in kindergarten of a group of children who have attended preschool at the University and we would like to compare this with the performance of other children of the same sex and age who have not had any preschool experience. We understand your child has not been to a day nursery or nursery school and this is why we would like to include him/her in the study.

If you permit us to include your child in this project we would give him/her a series of tests in the fall (October) and again in the spring (May or June) to see how well he or she has progressed. The tests are rather like games which the child enjoys playing. His/her performance on the tests would be kept confidential and any report of the work would provide group rather than individual results.

We will be grateful if you will permit us to study the progress of your child and we will appreciate having your decision about this indicated on the form attached. This form should be returned to the school at your earliest convenience.

Sincerely,

MJW/lv.
Encl.

Mary J. Wright, Ph.D., Professor and
Director, University Laboratory Preschool.

CONSENT FORM

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In response to Dr. Wright's request for permission to have

_____ participate in her study
Name of Child

Please check in the box below and sign.

Permission is given ☐ Date _____

Permission is not given ☐ Signed _____
Parent or Parents

- -

Dear Parents:

This is, first of all, to thank you for giving us permission to include your child in our studies of the effects of pre-kindergarten experience on the performance of children in the kindergarten and primary grades. We greatly appreciated your interest and cooperation.

As you know, was seen last fall by three different ladies. Everything went well and seemed to enjoy the sessions. These same ladies are looking forward to seeing again in May or early June.

Since the study will continue next spring and perhaps next year, we thought you might like to find out more about it and to meet at least one of the persons who will be working with your child. Hence, I have asked Mrs. Ada Meecham, whom I know you will like, to get in touch with you and arrange a short visit with you at home or elsewhere if you prefer, at a convenient time. She will be pleased to answer any questions you may have. She will also be grateful if you will give her some information about your child's health and development during early years.

Mrs. Meecham will phone you sometime in the near future. We hope that you will be able to find the time to see her, for we very much look forward to getting to know you and your child better.

Many thanks again.

Sincerely,

MJW/lv.

Mary J. Wright, Ph.D., Professor and
Director, University Laboratory Preschool.

UNIVERSITY OF WESTERN ONTARIO LABORATORY PRESCHOOL

Follow-Up Study

Parent Interview Form

Name of Child: _____ Date of Interview: _____

Name of Parent: _____

Address: _____ Telephone: _____

Person Interviewed: _____
(mother, father, both, other)

Assessment of Socio-Economic Status

Marital Status: Married ____ Divorced ____ Separated ____ Widow ____ Single ____

Source of Income: Employment ____ Welfare ____ Mother's Allowance ____

Other _____

Home Conditions: _____

_____

Father's Occupation: _____

Education: _____

Mother's Occupation: _____

Education: _____

Siblings (how many and age): _____

_____

Other adults or children in the home: _____

_____

Child's Developmental and Health History

Pregnancy: Full term ____ Premature ____

Health (any serious injury or illness; if so, describe): _____

_____

Sensory Equipment (vision, hearing): _____

Physical Deformities: _____

Special Behavioral or Management Problems: _____

_____

Summary (use reverse side if necessary)

Dear Parent:

This is to thank you for giving us permission to include your child in our studies of the effects of pre-kindergarten experience on the performance of children in the kindergarten and primary grades. We greatly appreciated your interest and cooperation.

This is also to let you know that we examined a larger number of young children in the fall than we can continue to study over a longer time period and that we will not be testing your child again in the spring.

Again, let me say how grateful we were for your positive approach to our request.

Very sincerely,

MJW/lv.

Mary J. Wright, Ph.D., Professor and
Director, University Laboratory Preschool.

Appendix B

Description of each individual subject in each group by age, sex, SES index, Preschool Inventory Percentile score and Binet IQ at entry into the project

GROUP A						GROUP B						GROUP C					
Subject #	CA	Sex	SES	PI	IQ	Subject #	CA	Sex	SES	PI	IQ	Subject #	CA	Sex	SES	PI	IQ
1	3-0	F	28.1	3	(84)	10	4-0	M	27.5	88	(112)	201	5-6	F	27.8	11	92
2	3-2	F	31.3	0	(77)	44	4-0	M	29.0	12	78	202	5-9	F	27.8	76	93
3	3-3	F	34.6	3	(102)	102	4-8	M	27.8	60	99	203	4-11	F	44.2	89	103
4	3-0	M	30.1	3	(88)	104	4-7	F	27.8	79	102	204	4-10	M	49.6	76	92
6	3-1	F	30.9	17	(104)	105	4-9	M	47.6	95	104	205	4-11	M	27.3	82	94
7	3-6	F	32.1	56	(108)	106	4-1	F	27.8	91	106	207	5-5	F	27.8	25	77
8	3-8	F	28.1	13	(97)	107	3-10	F	28.1	1	71	210	5-4	M	33.5	18	60
9	3-0	M	29.3	10	(102)	120	4-0	M	29.3	23	82	211	5-6	F	31.3	82	95
42	3-2	M	30.7	7	91	122	4-6	M	32.1	69	89	212	5-0	M	27.3	75	90
43	3-8	M	34.8	73	90	123	4-7	F	27.8	71	104	213	5-4	F	51.7	82	86
46	3-7	M	29.0	37	85	124	4-1	M	27.3	62	92	214	5-6	M	27.8	55	95
47	3-0	F	27.8	0	77	125	4-2	F	29.7	81	98	215	5-3	M	27.8	63	72
70	3-3	M	29.0	6	82							216	5-0	M	29.3	48	94
72	3-8	M	44.2	59	96							217	5-3	M	27.0	82	100
73	3-3	M	37.1	8	77							218	5-2	F	49.6	72	96
74	3-2	F	29.7	13	88							219	5-2	F	29.2	72	104
75	3-6	F	28.2	97	105							220	5-3	F	27.8	69	103
76	3-3	M	27.8	7	100							221	5-3	F	39.5	66	71
77	3-7	M	29.3	10	83							230	4-11	M	28.1	91	103
78	3-9	M	29.0	25	90							231	4-11	F	27.8	25	91
79	3-3	F	27.8	0	75							232	5-5	F	27.5	43	98
80	3-2	F	27.8	53	112							233	5-0	F	32.1	48	81
81	3-3	F	28.1	1	68							234	5-6	F	31.7	32	95
82	3-0	F	27.8	0	79							235	5-5	F	27.3	41	90
												236	4-11	M	39.8	25	85
												237	5-0	M	37.1	28	72
												239	5-2	M	27.3	35	73
												242	4-10	F	39.5	89	99
												243	4-10	M	31.3	91	102
												244	5-7	M	29.4	89	108

Notes:

1. CA = years and months. i.e., 3 years, 2 months, etc.

2. Binet. In Group A scores in brackets were obtained at the beginning of the child's second year in preschool.
   In Group B the score in brackets was obtained at the end of the subject's first year in preschool.

U.W.O. -- Wright

School Adjustment Report

Child's Name _____ Teacher _____

School _____ Date _____

PLEASE COMMENT ON THE FOLLOWING:

1. How well has this child adjusted to your class? Please check in the appropriate box and then comment.

   below average ☐ average ☐ above average ☐

2. Are this child's attitudes toward school, teachers and school work positive? Please check in the appropriate box and then comment.

   below average ☐ average ☐ above average ☐

3. Was the child well prepared academically for the work of your class? Please check in the appropriate box and then comment indicating strengths and weaknesses.

   below average ☐ average ☐ above average ☐

4. Did this child need special remedial treatment or special help of any kind during this academic year? Yes ☐ No ☐

   If yes, please describe:

5. How well has this child progressed academically during the current year? Please check and comment on changes in performance over the year.

   below average ☐ average ☐ above average ☐

6. Will the child be promoted to the next grade? Yes ☐ No ☐

   If no, please explain why:

7. Has this child attended school regularly? Yes ☐ No ☐

   If no, please explain:

8. What is your general appraisal of this child's personal and social competence?

9. What is your general appraisal of this child's academic competence?

10. Please provide any additional descriptions of this child's behavior which are particularly striking or characteristic, or any other relevant information.

U.W.O. -- Wright

BEHAVIOR RATING SHEET

Program

Child # _____ School _____

Teacher _____ Date _____

Instructions:

Please rate how this child behaves by circling one of the four responses to each question.

		Very Much Like	Somewhat Like	Very Little Like	Not At All Like
1.	Is usually carefree, rarely becomes frightened or apprehensive.	1	2	3	4
2.	Talks eagerly to adults about his own experiences and what he thinks.	1	2	3	4
3.	Often keeps aloof from others because he is uninterested, suspicious or bashful.	1	2	3	4
4.	Tries to figure out things for himself before asking adults or other children for help.	1	2	3	4
5.	Has little respect for the rights of other children; refuses to wait his turn, takes toys other children are playing with, etc.	1	2	3	4
6.	Seems disinterested in the general quality of his performance.	1	2	3	4

	Very Much Like	Somewhat Like	Very Little Like	Not At All Like
7. When faced with a difficult task, he either does not attempt it or gives up very quickly.	1	2	3	4
8. Likes to talk or socialize with teacher.	1	2	3	4
9. Is eager to inform other children of the experiences he has had.	1	2	3	4
10. Appears to trust in his own abilities.	1	2	3	4
11. Responds to frustration or disappointment by becoming aggressive or enraged.	1	2	3	4
12. Is constricted, inhibited or timid; needs to be urged before engaging in activities.	1	2	3	4
13. Asks many questions for information about things, persons, etc. (Emphasis here should be on question prompted by genuine curiosity rather than bids for attention.)	1	2	3	4
14. Emotional response is customarily overstrong; over-responds to usual classroom problems, frustrations, and difficulties.	1	2	3	4
15. Is lethargic or apathetic; has little energy or drive.	1	2	3	4
16. Is often quarrelsome with classmates for minor reasons.	1	2	3	4
17. Does not need attention or approval from adults to sustain him in his work or play.	1	2	3	4

	Very Much Like	Somewhat Like	Very Little Like	Not At All Like
18. Has a tendency to discontinue activities after exerting a minimum of effort.	1	2	3	4
19. Goes about activities with a minimum of assistance from others.	1	2	3	4
20. Often will not engage in activities unless strongly encouraged.	1	2	3	4
21. Starts working on something before getting the directions straight.	1	2	3	4
22. Is responsive and friendly in his relationships with the teachers in class (vs. cool or distant).	1	2	3	4
23. Looks to see how others are doing something before he does it (e.g., when teacher gives directions).	1	2	3	4
24. Quickly loses attention when teacher explains something to him.	1	2	3	4
25. Brings things to class that relate to current topics (e.g., collections, articles, etc.).	1	2	3	4
26. Appears to trust and like his teacher.	1	2	3	4
27. Sloppy in his work (e.g., products are dirty, marked up or wrinkled).	1	2	3	4
28. Relies on teacher for directions and to be told how to do things or proceed in class.	1	2	3	4

		Very Much Like	Somewhat Like	Very Little Like	Not At All Like
29.	Seeks out the teacher before or after class to talk about school or personal matters.	1	2	3	4
30.	Makes you doubt whether he is paying attention to what you are doing or saying (e.g., looks elsewhere, has blank stare).	1	2	3	4
31.	Tells stories or describes things in an interesting or colourful fashion (e.g., has an active imagination).	1	2	3	4
32.	Appears to like school.	1	2	3	4
33.	Offers to do things for the teacher (e.g., erase the board, open the door, etc.).	1	2	3	4
34.	Is unwilling to go back over and improve his work.	1	2	3	4
35.	Cooperates with his peers and works well in group projects.	1	2	3	4
36.	Is unable to follow directions (e.g., needs precise directions before he can proceed successfully).	1	2	3	4
37.	Is oblivious to what is going on in class (e.g., not "with it", seems to be in own "private" closed world).	1	2	3	4
38.	Initiates classroom discussion.	1	2	3	4

	Very Much Like	Somewhat Like	Very Little Like	Not At All Like
39. Cooperates with the teacher and conforms to requirements (is easy to manage).	1	2	3	4
40. Rushes through his work and therefore makes unnecessary mistakes.	1	2	3	4
41. Likes to be close to the teacher (e.g., hug, touch, sit near, etc.).	1	2	3	4
42. Has difficulty deciding what to do when given a choice between two or more things.	1	2	3	4
43. Is able to apply what he has learned to a new situation.	1	2	3	4
44. Is difficult to reach (e.g., seems preoccupied with his own thoughts, may have to call him by name to bring him out of himself).	1	2	3	4
45. Introduces into class discussions personal experiences or things he has heard which relate to what is going on in class.	1	2	3	4
46. Is attractive and likeable.	1	2	3	4
47. Is swayed by the opinion of his peers.	1	2	3	4
48. Is imaginative and offers novel ideas.	1	2	3	4
49. Is reflective and usually thinks before he acts.	1	2	3	4
50. Appears to be well liked by his peers.	1	2	3	4

Items included in each dimension

measured by the Behavior Rating Scale

	Dimensions	Items
1	Aggression	5, 11, 14, 16
2	Verbal-Social Participation	2, 8, 9, 13
3	Timidity	1, 3, 12, 20
4	Independence	4, 10, 17, 19
5	Achievement Motivation	6, 7, 15, 18
6	Impatience	21, 27, 34, 40
7	External Reliance	23, 28, 36, 42, 47
8	Inattentive-Withdrawn	24, 30, 37, 44
9	Creative-Initiative	25, 31, 38, 45
10	Need for Closeness to Teacher	22, 29, 33, 41

Additional (non-factored) Items

(a) Attitude to School	32
(b) Attitude to Teacher	26, 39
(c) Teacher Attitude to Child	46
(d) Peer relations	35, 50
(e) Comprehension	43
(f) Imagination	48
(g) Reflectivity	49

CHAPTER 2

Results at the Post-Kindergarten Levels

The results obtained at all levels above kindergarten are reported in this chapter

Second Year in School (Grade 1)

The subjects on whom either complete or partial data were obtained at this level were, in the fall and spring respectively, as follows:

	FALL	SPRING
Group A	24 (11 males, 13 females)	24 (11 males, 13 females)
Group B	12 (7 males, 5 females)	7 (4 males, 3 females)
Group C	23 (9 males, 14 females)	23 (9 males, 14 females)

The project terminated in the middle of the academic year in which the last cohort of Group B subjects (n = 5) was in Grade 1. The subjects in this cohort were, therefore, tested in the fall but not in the spring.

The groups at this level, as described above were not significantly different by age or SES index, but they were poorly balanced for sex. The proportion of girls to boys was greater in Group C than in the other two groups (1.6 as compared with 1.2 in Group A and .7 in Group B). This probably gave Group C an advantage over the other two groups because the failure rate in the primary grades has been generally found to be greater for boys than for girls.

Irregular attrition occurred at each assessment time particularly in the PG groups, i.e., one or other of the subjects was temporarily lost (absent from school and the whereabouts of his/her family unknown). Such a child was sometimes lost during one whole assessment period or only part of it. In the tabular presentations of results, the means shown are based on the scores of all of the subjects in each group who took the test, even though the subjects

and the number of subjects varied somewhat from test to test and assessment time to assessment time. When, however, the data were subjected to statistical analysis and changes over time were assessed, only the data on the subjects who were tested in both the fall and the spring were included.

The data were subjected to a series of 3 (Group) x 2 (Time) ANOVAs and, when positive effects were found, to post hoc analyses using Dunn's Multiple Comparisons test (Kirk, 1968). The fall data obtained with the Stanford Binet and the Stanford Early School Achievement tests, which included scores on all 12 subjects in Group B rather than only 7 of them, were subjected also to one-way ANOVAs to explore for group effects when the Group B sample was larger.

Intellectual and Cognitive Competence

Stanford Binet IQ (Fall assessment). The two PG groups (A and B) maintained their preschool IQ gains and Group B maintained the additional gain it made in kindergarten. Group C also maintained its kindergarten gain. The mean Binet IQs of the three groups, at each preschool or primary grade level tested up to Grade 1, are shown in Table 8.

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Insert Table 8 about here

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At the Grade 1 level, Group B scored 5 points higher than Group A. Their mean scores were 109 and 104, respectively. This difference was not statistically significant, but it was consistent with the difference found between these two groups at the end of Kindergarten when their mean scores were 108 and 104, respectively.

Both of the two PG groups (A and B) had higher mean scores than Group C (Group A, $p < .05$; Group B, $p < .01$) at the Grade I level.

Table 8

Mean and (SD) Binet IQs of the groups at each assessment time from entry into the project until the beginning of Grade 1

	Preschool age 3-4 years						Preschool age 4-5 years						Kindergarten age 5-6 years						Grade 1 age 6		
	Fall			Spring			Fall			Spring			Fall			Spring			Fall		
	n	X	SD	n	X	SD	n	X	SD	n	X	SD	n	X	SD	n	X	SD	n	X	SD
Group A	16	87	(11.7)	16	97	(11.4)	24	95	(13.8)	23	103	(10.1)	23	103	(10.2)	23	104	11.3	24	104	11.7
Group B							11	93	(11.8)	12	101	(11.5)	12	104	(9.0)	12	108	8.3	12	109	14.2
Group C													24	91	(11.0)	24	95	11.3	23	96	1.7

Circus "Say and Tell" (Spring assessment only). On the functional language sub-test, there was a significant Group effect, F (2,48) = 4.24, $p < .01$. Group A (but not Group B) scored higher than Group C ($p < .05$). However, on the other sub-tests in this measure, there were no statistically significant differences among the groups.

It is noteworthy that when judged against US means, the functional language scores of all three groups were above average. The mean scores obtained on this test are presented in Table 9.

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Insert Table 9 about here

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Circus "Think it Through" and "How Much and How Many" (Spring assessment only). Although the trends suggested somewhat better overall performance for the two PG groups (A and B) than Group C, the differences between them only approached statistical significance on Part II of "How Much and How Many" (Mathematical Concepts and Conservation), F (2,49) = 3.16, $p < .06$. On this measure Group B (but not Group A) scored somewhat higher than Group C. However, when judged against US norms, the mean scores of the two PG groups (A and B) were average or above average (on 4 sub-tests in Group A and all 5 sub-tests in Group B), but the scores of Group C were average on only one of the sub-tests. The mean scores obtained on this test are presented in Table 10.

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Insert Table 10 about here

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KRISP. In the fall, 88% of the subjects in Group A, 71% in Group B, and 78% in Group C performed satisfactorily on this test and in the spring, 100% of Group A, 100% of Group B, and 86% of Group C performed satisfactorily. At this level the KRISP appeared to be easy for most of the subjects and these

Table 9

Mean and (SD) Circus "Say and Tell" Form B scores

of each group at the end of Grade 1

Section of Test	Group A (n = 22)	Group B (n = 6)	Group C (n = 23)	U.S. National Means
Part I Description				
Pencil A responses	7.6 (0.7)	7.7 (0.5)	7.2 (0.7)	7.0 (1.4)
Dollar A responses	2.7 (0.8)	2.8 (1.0)	2.7 (0.7)	3.8 (1.8)
Part II Functional Language				
Total A responses	21.7 (4.8)	18.0 (3.1)	18.4 (3.4)	14.1 (3.7)
Part III Narration				
Number of words	104.7 (54.9)	88.0 (25.2)	86.6 (29.7)	56.6 (34.7)
Number of different words	63.9 (24.7)	40.3 (9.5)	40.1 (14.2)	
Ratio of different words to total words	.5 (0.1)	.5 (.0)	.5 (.1)	.5 (.1)
Ratio of different situations to total words	.5 (.1)	.2 (.0)	.2 (.1)	.2 (.1)
Number of external events	3.9 (4.4)	1.7 (1.5)	2.1 (1.8)	1.4 (3.1)

Table 10

Mean and (SD) Circus "Think it Through" and "How Much and How Many"

Form B scores of the Groups at the end of Grade 1

Measure	Group A (n = 23)	Group B (n = 6)	Group C (n = 23)	U.S. National Means
Think it Through				
Word problems (classification)	11.9 (1.2)	11.5 (0.84)	10.04 (3.9)	11.1 (1.05)
Patterns (deducing and applying rules)	5.8 (2.4)	7.2 (1.2)	5.74 (2.0)	5.62 (1.19)
Mazes (selecting shortest path to goal	5.3 (1.4)	6.3 (0.8)	5.04 (1.4)	5.49 (0.63)
How Much and How Many				
Part I (counting, numerical concepts, adding, subtracting)	25.3 (5.2)	27.5 (4.8)	23.13 (3.8)	24.5 (4.2)
Part II (mathematical concepts and conservation)	19.9 (4.0)	22.0 (2.3)	18.04 (3.7)	18.3 (2.7)

results may have, at least in part, reflected ceiling effects.

In summary, therefore, at this level, the intellectual functioning of the two PG groups, (A and B) was, as measured by their Binet IQs, superior to that of Group C, and, although their cognitive competence, as assessed by Circus "Think it Through" and "How Much and How Many", appeared to be little different from that of Group C when statistical measures of the significance of the differences were applied, when judged against available normative data for children in the United States, their performance was generally average or above average while that of Group C was generally below average. On the language test Circus "Say and Tell", however, although Group A scored higher than the other two groups on functional language, all three groups performed at an above-average level when judged against American norms.

Academic Achievement

Stanford Early School Achievement test, Level II. The mean scores of the groups on this battery of tests are presented in Table 11.

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Insert Table 11 about here

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The one-way ANOVA's on the fall data, when the number of subjects in Group B was 12, yielded significant group effects for Mathematics, Letters and Sounds and Aural Comprehension, but not for Environment or Word reading (and Sentence reading was not tested in the fall) as follows:

Mathematics, F (2,56) = 8.9, $p < .01$. Group A was not different from Group B, but both Groups A and B scored higher than Group C ($p < .05$ and $p < .01$, respectively).

Letters and Sounds, F (2,56) = 6.9, $p < .01$. Group A was not different from Group B, but both Groups A and B scored higher

Table 11

Mean and (SD) Stanford Early School Achievement, Level II scores of the groups at the beginning and end of Grade 1

Test	Group A		Group B		Group C	
	Fall (n = 24)	Spring (n = 22)	Fall (n = 12)	Spring (n = 7)	Fall (n = 23)	Spring (n = 23)
Environment	22.3 (5.6)	27.1 (4.7)	23.1 (4.9)	25.6 (2.9)	19.3 (3.5)	22.0 (3.6)
Mathematics	27.8 (10.1)	40.7 (10.1)	33.4 (10.8)	46.7 (8.2)	20.7 (5.6)	36.7 (8.7)
Letters and Sounds	28.5 (7.3)	36.3 (3.9)	30.1 (6.1)	38.3 (2.4)	21.8 (8.5)	33.7 (5.6)
Aural Comprehension	17.9 (2.9)	19.0 (3.3)	17.2 (4.0)	19.4 (2.0)	13.4 (3.4)	17.0 (3.9)
Word Reading	25.7 (11.7)	49.3 (7.6)	26.6 (6.2)	49.9 (6.3)	20.9 (9.5)	42.5 (11.5)
Sentence Reading		18.8 (12.3)		14.0 (8.1)		13.1 (11.8)
Total Score		191.1 (31.7)		193.9 (18.5)		164.9 (35.7)

Note: US NORMS: Range of scores in Stanine 5 indicating average performance

Environment	23-25 (beginning of grade)	25-27 (end of grade)
Mathematics	29-33	43-46
Letters & Sounds	28-32	37-38
Aural Comprehension	16-17	19-20
Word Reading	23-28	49-53
Sentence Reading	---	18-25
Total Score	---	190-209

than Group C (both $p < .05$).

Aural Comprehension, F (2,56) = 11.4, $p < .01$. Group A was not different from Group B, but both Groups A and B scored higher than Group C (both $p < .01$).

The 3 (Group) x 2 (Time) ANOVAs on the fall and spring data, with the number of subjects in Group B only 7, yielded the following results:

Environment. There was a significant group effect, F (2,49) = 6.7, $p < .01$. In the fall the differences among the groups were not large enough to be significant. There was, however, a significant Time effect, F (1,49) = 52.1, $p < .01$. Both Group A and Group C (but not Group B) made significant gains (both $p < .01$). In the spring, although the difference between the two PG groups (A and B) was not significant, Group A (but not Group B) scored significantly higher than Group C ($p < .01$). As judged against US means, in both the fall and the spring, the performance of the two PG groups (A and B) was average, but the performance of Group C was below average.

Mathematics. There was a significant Group effect, F (2,49) = 6.3, $p < .01$. In the fall the difference between the two PG groups (A and B) was not significant, but Group B (although not Group A) scored higher than Group C ($p < .05$). There was a significant Time effect, F (1,49) = 156.4, $p < .01$. All three groups made significant gains ($p < .01$). In the spring there were no statistically significant differences among the groups. However, as judged against US norms, in the fall the scores of the two PG groups (A and B) were average and the score of Group C was below average, and in the spring the score of Group B was

high average, but at this time Group A as well as Group C scored below average.

Letters and Sounds. There was a significant Group effect, F (2,49) = 7.5, $p < .01$. In the fall, the difference between the two PG groups (A and B) was not significant, but both of these groups scored higher than Group C (both $p < .01$). There was a significant Time effect, F (1,49) = 93.3, $p < .01$ and a significant Group x Time Interaction effect, F (2,49) = 3.14, $p < .05$. Groups A and C, but not Group B made significant gains (both $p < .01$). In the spring, there were no statistically significant differences among the groups. However, as judged against US norms, in the fall the performance of the two PG groups (A and B) was average, but Group C was below average and, in the spring, the performance of Group B was still average, Group A was slightly below average, but Croup C was well below average.

Aural Comprehension. There was a significant Group effect, F (2,49) = 7.8, $p < .01$. In the fall, the difference between the two PG groups (A and B) was not significant, but Group A (although not Group B) scored higher than Group C ($p < .01$). There was a significant Time effect, F (1,49) = 20.4, $p < .01$. Group C (but not Groups A or B) made a significant gain, $p < .01$. In the spring, there were no statistically significant differences among the groups. However, as judged by US norms, in both the fall and the spring, the performance of the two PG groups (A and B) was average and that of Group C was below average.

Word Reading. This test was given only in the spring. A one-way

ANOVA on the results revealed no significant differences among the groups. However, as judged against US norms, the performance of Group A was average, but that of both Groups B and C was below average.

Total Score. A one-way ANOVA of the spring total scores, which included Word Reading, yielded a main effect for Group, F (2,49) = 4.45, $p < .05$. There was no statistically significant difference between the two PG groups (A and B), or between Groups B and C, but Group A scored higher than Group C ($p < .05$). Also when judged against US norms the performance of the two PG groups was average, but that of Group C was below average.

In summary, the differences between the two PG groups and Group C observed in the fall appeared to have been substantially reduced by the end of the school year. However, when the spring performance of Groups A and B was judged against available normative data, it was, on the whole, average while that of Group C was below average.

School Adjustment Reports. The percentages of subjects assigned to each judgment category in these reports, are shown by group in Table 12. No reports

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Insert Table 12 about here

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were submitted on five subjects (3 in Group A and 1 in each of Groups B and C), but information about promotion to the next grade (pass/fail) was otherwise obtained on 3 of them (2 in Group A and one in Group B). Also in the submitted reports, some questions were not answered. In the table the number of subjects on whom information was obtained is, therefore, shown by item.

1) Academic Competence (item 9). Of the PGs who were judged on this item, almost half of those in Group A (47%) were considered

Table 12

Percentage of subjects assigned to each judgment category of the School Adjustment Report by group at the end of their second year in school

1.	How well has this child adjusted to your class?							
	Group A	42.9	above average	47.6	average	9.5	below average	(n = 21)
	Group B	0	above average	100.0	average	0	below average	(n = 6)
	Group C	9.1	above average	68.2	average	22.7	below average	(n = 22)
2.	Are this child's attitudes to school, teachers, and school work positive?							
	Group A	42.9	above average	38.1	average	19	below average	(n = 21)
	Group B	0	above average	83.3	average	16.6	below average	(n = 6)
	Group C	18.2	above average	81.8	average	0	below average	(n = 22)
3.	Was this child well prepared academically for the work of your class?							
	Group A	19.0	above average	52.4	average	28.6	below average	(n = 21)
	Group B	0	above average	50.0	average	50.0	below average	(n = 6)
	Group C	4.3	above average	59.1	average	36.4	below average	(n = 22)
4.	How well has this child progressed academically during the current year?							
	Group A	33.3	above average	38.1	average	28.6	below average	(n = 21)
	Group B	0	above average	33.3	average	66.6	below average	(n = 6)
	Group C	13.6	above average	63.6	average	22.7	below average	(n = 22)
5.	Did this child need remedial help?							
	Group A	NO	76.2	YES	23.8			(n = 21)
	Group B	NO	33.3	YES	66.6			(n = 6)
	Group C	NO	54.5	YES	45.5			(n = 22)
6.	Did this child attend school regularly?							
	Group A	YES	85.7	NO	14.3			(n = 21)
	Group B	YES	66.6	NO	33.3			(n = 6)
	Group C	YES	90.9	NO	9.1			(n = 22)
7.	Was this child promoted to the next grade?							
	Group A	YES	87.0	NO	13.0			(n = 23)
	Group B	YES	85.7	NO	14.3			(n = 7)
	Group C	YES	77.3	NO	22.7			(n = 22)
8.	What is your general appraisal of this child's personal and social adjustment?							
	Group A	75.0	satisfactory	20.0	some concern	5.0	poor	(n = 20)
	Group B	80.0	satisfactory	20.0	some concern	0	poor	(n = 5)
	Group C	40.9	satisfactory	36.4	some concern	22.7	poor	(n = 22)
9.	What is your general appraisal of this child's academic competence?							
	Group A	47.4	above average	42.1	average	10.5	below average	(n = 19)
	Group B	0	above average	100.0	average	0	below average	(n = 5)
	Group C	13.6	above average	59.1	average	27.3	below average	(n = 22)

above average, 42% average and 11% below average. In Group B, all were considered average and none below average and, in Group C, although 14% were considered above average and 59% average, 27% were considered below average.

2) Academic Preparation (item 3). Somewhat more of the Group A (71%) than the Group B (60%) or Group C (63%) subjects were considered above average or average in preparation for the work of Grade 1.

3) Remedial Instruction (item 5). Proportionately fewer of the Group A (24%) than the Group B (67%) or Group C (46%) subjects required remedial academic instruction.

4) Promotion and Failure Rate (item 7). Twenty of the 23 subjects in Group A (87%), 6 of the 7 subjects in Group B (86%) and 17 of the 22 subjects in Group C (77%) were promoted to the next grade. The failure rate was, therefore, 13%, 14%, and 23% in Groups A, B, and C respectively.

5) Failures and Sex. Of the 9 children (all groups combined) who were not promoted, more were boys (n = 7) than girls (n = 2).

6) Failures and Regularity of Attendance at School. Poor attendance at school appeared to be related to failures among the boys (in 5 of the 7 cases), but not the girls. In the PG groups, all three of the boys who failed (2 in A, 1 in B) had poor attendance records and in two cases the teachers stated that they had been in school less than half of the time. Both of these children were said to have average or better ability and to be capable of doing Grade 1 work (and this was confirmed by their test scores), but that they had not had time to develop the academic skills

needed for progression to the next grade.

In summary, the teachers again (as at the kindergarten level) judged Group A more favourably than Group B in academic competence even though as measured by the academic achievement tests, Group B was achieving about as well as Group A. Also Group B was generally judged no more favourably than Group C even though Group B's overall performance on the achievement tests was generally average while that of Group C was below average.

Personal and Social Adjustment

School Adjustment Reports. The information obtained from the teachers' reports on social and personal adjustment was reported along with the information obtained on academic competence in Table 12. The findings were as follows:

1) General Personal and Social Adjustment (item 8). More of the PG subjects in both Groups A and B (75% and 80% respectively) than in Group C (41%) were considered to be satisfactorily adjusted.
2) Adjustment to the Class (item 1). More of the Group A (43%) than the Group B (0%) or Group C (9%) subjects were said to have adjusted to the class in an above average way.
3) Attitudes to School (item 2). More of the Group A (43%) than the Group B (0%) or Group C (18%) subjects were said to have positive attitudes to school which were above average.

In summary, here again the teachers' judgments favoured the Group A subjects over those in the other two groups.

Behavior Rating Scale. There were no significant differences among the groups on any of the dimensions assessed by this measure. The mean scores

Table 13

Mean and (SD) Behavior Rating Scale scores of the groups at the end of their second year in school

Dimension	Group A (n = 21)	Group B (n = 6)	Group C (n = 22)
1. Aggression[1]	12.4 (3.4)	11.2 (4.0)	12.9 (3.7)
2. Verbal-Social Interaction	12.9 (3.2)	10.3 (3.1)	12.2 (3.0)
3. Timidity[1]	12.6 (3.2)	12.6[3] (2.1)	12.5 (3.1)
4. Independence	11.7 (3.2)	11.2[3] (1.8)	11.3 (3.5)
5. Achievement Motivation	11.2 (3.6)	10.2 (3.5)	12.4 (3.2)
6. Impatience[1]	11.9[3] (3.0)	9.3 (3.3)	11.3 (3.0)
7. External Reliance[1]	13.1[3] (3.4)	14.4[3] (1.5)	12.3 (4.0)
8. Inattentive-Withdrawn[1]	11.7[3] (4.2)	12.3 (2.7)	12.9 (3.5)
9. Creative-Initiative	10.4[3] (3.7)	9.2 (4.2)	8.8 (3.6)
10. Need for Closeness	11.9[3] (3.4)	11.0 (3.0)	12.3 (2.9)
Total (all dimensions)	119.9[3] (26.8)	114.7[3] (20.3)	118.7 (24.9)
Ambition[2]	35.6[3] (8.1)	35.0[3] (6.3)	35.7 (8.7)

Notes:

1. For Aggression, Timidity, Impatience, External Reliance and Inattentive-Withdrawn higher scores indicate less of the behavior.
2. "Ambition" is a combined score on Timidity, Independence and Achievement Motivation.
3. Responses to some items were not given. Thus, the number of scores on which the mean for this dimension was based was 20 or (in two cases) 19 in Group A and 5 in Group B.

obtained by each group are presented in Table 13.

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Insert Table 13 about here

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Third Year in School (Grade 2, or Grade 1 repeated)

The subjects on whom either complete or partial data were obtained at this level were, in the fall and spring respectively, as follows:

	FALL		SPRING	
Group A	22	(10 boys, 12 girls)	11	(5 boys, 6 girls)
Group B	2	(2 boys, 0 girls)	2	(2 boys, 0 girls)
Group C	16	(6 boys, 10 girls)	16	(6 boys, 10 girls)

The project terminated in the middle of the academic year in which the subjects in the third cohort of Group A were at this level. Therefore only fall data were obtained on them.

The groups, as described above were not significantly different by age or SES index, but they were poorly balanced for sex. There were proportionately more girls and fewer boys in Group C than in the PG Groups (A and B). In Group B there were only two boys. Because of the size of Group B, no statistical analyses of the differences between this and the other two groups were made. The scores of Group B are, however, reported in the Tables.

As at the Grade 1 level, irregular attrition occurred at each assessment time, i.e., one or other of the subjects was temporarily lost. Hence the number of subjects on which the results are based varies somewhat from test to test.

Intellectual Competence

Stanford Binet IQ (fall assessment). The two PG groups (A and B) continued to maintain their preschool IQ gains. In Group A the mean IQ of the 21 subjects

tested was 104.2 (SD 13.0). At the end of preschool the mean IQ of this sample of Group A subjects was 101.8 (SD 12.2). In Group B the mean IQ of the two subjects was 103. At the end of preschool it was 102. Thus, there was no evidence of decline in the IQs of the PG groups.

In Group C the mean IQ of the 16 subjects tested was 94.2 (SD 8.7) just about the same as it was for this sample of Group C subjects at the end of kindergarten (93.8, SD 12.0).

Academic Achievement

Stanford Achievement Test. Primary I Battery. (fall assessment). The data on Groups A and C (but not B) were subjected to a series of one-way ANOVAs to explore for group effects and it was found that the mean scores of Group A were significantly higher than those of Group C on all but one (Word Meaning) of the tests. The mean scores of the groups are presented in Table 14. The F (1,35)

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Insert Table 14 about here

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values for the measures which differentiated Groups A and C and their significance levels were as follows:

Paragraph Meaning	6.42	$p < .05$
Vocabulary	6.31	$p < .05$
Spelling	6.52	$p < .05$
Word Study Skills	6.70	$p < .05$
Arithmetic	5.12	$p < .05$

As judged against US norms the performance of Group A was average or above average on three of the six tests (Vocabulary, Word Study Skills, and Arithmetic), but the performance of Group C was below average on all six measures. Group B performed at an average level on two of the tests (Arithmetic and Spelling) but

Table 14

Mean and (SD) Stanford Achievement test Primary I Battery grade scores of the groups at the beginning of their third year in school

Test	Group A (n = 21)		Group B (n = 2)		Group C (n = 16)	
	X	SD	X	SD	X	SD
Word Reading	19.7	(6.6)	16.5	(.7)	15.6	(7.0)
Paragraph Meaning	18.9	(8.9)	15.5	(2.1)	11.6	(6.39)
Vocabulary	21.3	(7.1)	22.0	(1.4)	16.4	(3.3)
Spelling	18.7	(6.9)	18.5	(3.5)	11.69	(9.7)
Word Study Skills	24.5	(10.4)	19.0	(4.2)	16.9	(5.87)
Arithmetic	20.3	(5.1)	20.5	(6.4)	16.6	(6.76)

Note: The range of scores reflecting average performance, based on US norms, is 20-22 for each test.

below average on the other measures.

Stanford Achievement Test. Primary II Battery (spring assessment). The data on Groups A and C (but not B) were subjected to a series of one-way ANOVAs to explore for group effects and it was found that the mean scores of Group A were significantly higher than those of Group C on 5 of the 8 tests. The mean scores of the groups are presented in Table 15. The F (1,23) values for the measures

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Insert Table 15 about here

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which differentiated Groups A and C and their significance levels were as follows:

Word Meaning	12.36	$p < .01$
Paragraph Meaning	7.78	$p < .01$
Science and Social Studies	6.43	$p < .05$
Word Study Skills	7.30	$p < .05$
Language	11.19	$p < .01$

As judged against US norms the performance of Group A was average on Word Study Skills and Spelling, but somewhat below average on all of the other tests. The performance of Group C was, however, well below average on all of the tests. The one Group B subject tested at this time performed at an average level on three of the tests (Paragraph Meaning, Spelling, and Word Study Skills), but somewhat below average on the others.

School Adjustment Reports. A summary of the teachers' judgments of the academic competence and progress of the subjects during their third year in school is presented in Table 16. It should be noted that reports were obtained on only

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Insert Table 16 about here

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8 of the 11 Group A subjects and on only 15 of the 16 Group C subjects. Also

Table 15

Mean and (SD) Stanford Achievement test Primary II Battery grade scores of the groups at the end of their third year in school

Test	Group A (n = 10)		Group B (n = 1)	Group C (n = 15)	
	X	SD	X	X	SD
Word Meaning	27.9	(5.3)	21	18.07	(7.7)
Paragraph Meaning	24.4	(5.8)	29	14.3	(10.3)
Science and Social Studies	25.1	(8.2)	26	18.67	(4.5)
Spelling	28.8	(5.2)	30	21.8	(12.8)
Word Study Skills	33.9	(14.7)	29	20.7	(9.9)
Language	26.4	(7.6)	22	12.5	(11.6)
Arithmetic Computation	23.0	(10.3)	26	19.3	(6.1)
Arithmetic Concepts	20.8	(4.9)	19	16.6	(5.6)

Note: The range of scores representing average performance, based on US norms, are:

Word Meaning	28-30
Paragraph Meaning	27-30
Sciene & Social Studies	27-31
Spelling	26-31
Word Study Skills	27-33
Language	27-30
Arithmetic Computation	28-30
Arithmetic Concepts	27-31

Table 16

Percentage of subjects assigned to each judgment category of the School Adjustment Report by group at the end of their third year in school

1. How well has this child adjusted to your class?

Group A	50	above average	37.5	average	12.5	below average	(n = 8)
Group B	0	above average	100.	average	0	below average	(n = 2)
Group C	21.4	above average	57.1	average	21.4	below average	(n = 14)

2. Are this child's attitudes toward school, teachers, and school work positive?

Group A	25	above average	62.5	average	12.5	below average	(n = 8)
Group B	0	above average	50.0	average	50.0	below average	(n = 2)
Group C	33.3	above average	46 7	average	20.0	below average	(n = 15

3. Was this child well prepared academically for the work of your class?

Group A	37.5	above average	50.	average	12.5	below average	(n = 8)
Group B	0	above average	50.	average	50.	below average	(n = 2)
Group C	0	above average	53.3	average	46.7	below average	(n = 15)

4. How well has this child progressed academically during the current year?

Group A	25.0	above average	75.0	average	0	below average	(n = 8)
Group B	0	above average	50.0	average	50.0	below average	(n = 2)
Group C	6.7	above average	73.3	average	20.0	below average	(n = 15)

5. Did this child need remedial help?

Group A	75.0	NO	25.0	YES	(n = 8)
Group B	50.0	NO	50.0	YES	(n = 2)
Group C	33.3	NO	66.7	YES	(n = 15)

6. Did this child attend school regularly?

Group A	87.5	YES	12.5	NO	(n = 8)
Group B	100.0	YES	0	NO	(n = 2)
Group C	100.0	YES	0	NO	(n = 15)

7. Was this child promoted to the next grade?

Group A	100.0	YES	0	NO	(n = 11)
Group B	100.0	YES	0	NO	(n = 2)
Group C	68.8	YES	31.3	NO	(n = 16)

8. What is your general appraisal of this child's personal and social competence?

Group A	62.5	satisfactory	25.o	some concern	12.5	poor	(n = 8)
Group B	100.0	satisfactory	0	some concern	0	poor	(n = 2)
Group C	64.3	satisfactory	21.4	some concern	14.3	poor	(n = 14)

9. What is your general appraisal of this child's academic competence?

Group A	50.0	above average	50.0	average	0	below average	(n = 8)
Group B	0	above average	100.0	average	0	below average	(n = 2)
Group C	0	above average	61.5	average	38.5	below average	(n = 13)

no answers were given to some of the items in the reports obtained on the Group C subjects. Information about promotion to the next grade (pass/fail data) was however, otherwise obtained on all of the subjects in all of the groups. The findings were as follows:

1) General academic competence (item 9). In Group A half of the subjects on which reports were obtained were considered above average. The other half were considered average. In Group B both subjects were considered average. Thus, none of the PGs was considered below average. In contrast, in Group C no subject was considered above average, 62% were considered average, but 38% were considered below average.
2) Academic preparation (item 3). In Group A 38% of the children were considered above average. 50% average and 13% below average. In Group B one subject was considered average and the other below average. In Group C no subject was judged to be above average, 53% were considered average and 47% below average.
3) Special remedial instruction (item 5). In Group A only 25% of the subjects were given special instruction as compared with 67% of Group C. In Group B one subject received special instruction but the other did not.
4) Promotion (item 7). In the two PG groups (A and B) all of the subjects (100%) were promoted, as compared with only 69% in Group C. In Group C 5 children failed (31% of the group), 3 who were in the second grade (2 girls and one boy) and 2 who were repeating first grade (both boys).

Personal and Social Competence

School Adjustment Reports. The percentage of subjects in each group who

were assigned to each of the judgment categories in the personal-social adjustment area were shown in Table 16. The findings were as follows:

1) General personal and social competence (item 8). There were no apparent differences between groups A and C in this area as judged by the teachers.

2) Adjustment to class (item 1). A somewhat larger proportion of Group A than Group C subjects were considered to have adjusted to the class in an above-average way and somewhat fewer to have adjusted in a below-average way.

3) Attitude toward school (item 2). There appeared to be no marked differences between groups A and C in their attitudes to school, as judged by the teachers.

Behavior Rating Scales. There were no significant differences between Groups A and C on any of the dimensions assessed by this rating scale. The mean scores of the groups on each dimension assessed are presented in Table 17.

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Insert Table 17 about here

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Fourth Year in School (Grade 3 or below)

The subjects on whom either complete or partial data were obtained at this level were as follows:

	FALL		SPRING	
Group A	7	(2 males, 5 females)	7	(2 males, 5 females)
Group B	2	(2 males)	1	(1 male)
Group C	5	(1 male, 4 females)	5	(1 male, 4 females)

Table 17

Mean and (SD) Behavior Rating Scale scores for Groups A, B, and C at the end of their third year in school

Dimension	Group A (n = 8)	Group B (n = 2)	Group C (n = 15)
1. Aggression	13.1 (2.2)	11.0 (5.6)	13.1 (3.3)
2. Verbal-Social Interaction	11.8 (3.77)	10.0 (0)	11.5 (3.8)
3. Timidity	11.1 (3.6)	12.0 (4.2)	11.7 (4.1)
4. Independence	11.4 (4.69)	11.5 (3.5)	10.0 (3.2)
5. Achievement Motivation	12.4 (3.07)	7.0 (0)	10.9 (2.6)
6. Impatience	12.1 (3.87)	10.0 (1.4)	12.6 (2.9)
7. External Reliance	13.1 (4.26)	8.5 (.7)	11.9 (3.2)
8. Inattentive-Withdrawn	11.4 (3.46)	10.5 (.7)	11.2 (3.4)
9. Creative-Initiative	10.5 (4.17)	5.0 (1.4)	10.0 (4.4)
10. Need for Closeness	11.5 (3.1)	7.5 (.7)	12.5 (3.2)
11. Ambition	34.9 (9.7)	30.5 (.7)	32.6 (7.9)
12. Total	118.4 (30.0)	93.0 (8.5)	115.5 (22.9)

Note: For Aggression, Timidity, Impatience, External Reliance, Inattentive -Withdrawn, higher scores indicate less of the behavior.

Intellectual Competence

Stanford Binet IQs (fall assessment). Scores on this measure were obtained on all subjects as described above. The mean scores of the groups were for A, B, and C respectively 105.2 (SD 12.2), 110.5 and 90.2 (SD 6.2).

The PG groups (A and B) were still maintaining their preschool IQ gains. At the end of preschool their mean scores were: for these 7 Group A subjects 106.9 (SD 12.6) and for these 2 Group B subjects 101.5.

In the Control group the trend was toward somewhat less satisfactory performance than that displayed at the kindergarten level. The mean scores of these 5 Group C subjects at the beginning and end of kindergarten were 91.8 (SD 9.4) and 95.0 (SD 7.7) respectively.

Academic Achievement

The Stanford Achievement Test Primary II Battery was administered in both the fall and the spring. It was given to all of the subjects in Groups A and C as described above, but to only one of the Group B subjects at only one assessment time (fall). The mean scores of Groups A and C and the scores of the one subject tested in Group B are presented in Table 18.

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Insert Table 18 about here

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Because the samples were so small at this level, statistical analysis of the data obtained on them was probably inappropriate. Only very large differences could be expected to be statistically significant. A series of 2 (Group) x 2 (Time) ANOVAs were, however, performed on the scores of Groups A and C. It was found that although Group A scored higher than Group C on all of the tests the differences were large enough to be statistically significant on only Word Meaning and Paragraph Meaning. There were significant main effects for Time, but no interaction effects,

Table 18

Mean and (SD) Stanford Achievement Test Primary II Battery grade scores of the groups at the beginning and end of their fourth year in school

	Group A		Group B		Group C	
	Fall n = 7	Spring n = 7	Fall n = 1	Spring n = 0	Fall n = 5	Spring n = 5
Word Meaning	30.7 (6.8)	33.0 (3.8)	30		17.8 (10.6)	24.4 (4.7)
Paragraph Meaning	30.6 (5.8)	37.1 (5.5)	31		17.0 (10.9)	25.6 (7.4)
Science and Social Studies	26.6 (7.8)	30.0 (8.9)	26		19.2 (4.8)	24.4 (10.8)
Spelling	29.0 (6.7)	36.1 (5.6)	30		23.8 (5.2)	30.2 (8.04)
Word Study Skills	39.9 (20.2)	48.0 (18.3)	31		26.0 (12.6)	37.2 (13.5)
Language	30.3 (12.2)	38.7 (7.9)	32		18.2 (10.6)	31.2 (12.4)
Arithmetic Computation	27.6 (4.6)	34.7 (5.2)	35		22.4 (7.1)	29.0 (9.1)
Arithmetic Concepts	25.7 (6.2)	35.0 (10.0)	27		20.2 (7.4)	23.2 (6.6)

Note: US norms: Range of scores in Stanine 5 indicating average performance

Word Meaning	29-33 (beginning of year)	37-40 (end of year)
Paragraph Meaning	30-33	36-41
Science and Social Studies	29-33	36-40
Spelling	29-32	37-40
Word Study Skills	28-35	33-45
Language	29-32	36-42
Arithmetic Computation	30-32	37-40
Arithmetic Concepts	29-33	34-41

on all of the tests except Science and Social Studies, i.e., both groups made significant gains from fall to spring and the size of these gains were not significantly different. The fact that neither group made significant gains on the Science and Social Studies test suggests that what was measured by this test may not have been emphasized at this primary grade level in the London public schools.

As judged against US norms (range of scores in Stanine 5 representing average performance, as shown in Table 18) in the fall Group A scored above average on Word Study Skills and average on four other tests (Word Meaning, Paragraph Meaning, Spelling and Language), but somewhat below average on 3 measures (Science and Social Studies, Arithmetic Computation, and Arithmetic Concepts). The one subject in Group B scored above average on Arithmetic Computation, average on 5 other tests and below average on only 2 (Science and Social Studies and Arithmetic Concepts). In contrast, Group C scored below average on all eight tests, well below average on all of them except Word Study Skills.

In the spring, Group A was still scoring above average on one test (Word Study Skills), average on three tests (Paragraph Meaning, Language, and at this time Arithmetic Concepts), but somewhat below average on 4 tests (Word Meaning, Spelling, Science and Social Studies, and Arithmetic Computation). Group C scored average on one test (Word Study Skills), but continued to score well below average on all of the other seven tests.

Teachers' Judgments of Academic Competence. School Adjustment reports were obtained on only 6 of the 7 subjects in Group A and 4 of the 5 subjects in Group C. Information about promotion (pass/fail data) were, however, otherwise obtained on all of the subjects. Before considering the data derived from these reports, it should be pointed out that all of the PGs were at grade level (Grade 3), but two of the Control subjects were one year below grade level (i.e., in Grade 2). The

findings were as follows:

1) General academic competence (item 9). In Group A, 3 of the 6 subjects on whom reports were obtained were judged to be above average and the other 3 average. In Group C, 3 of the 4 subjects on whom reports were obtained were considered average and the other one below average.

2) Preparation for the work of the class (item 3). In Group A, 3 were considered above average, 2 average, and 1 below average. In Group C, 2 were considered average, and 2 below average.

3) Special remedial help (item 5). In both Groups A and C half of the subjects received remedial help.

4) Promotion (item 7). All of the subjects (7 in Group A, 2 in Group B, and 5 in Group C were promoted).

Social and Personal Adjustment

School Adjustment Reports. The information derived from these reports about the childrens' social and personal adjustment can be summarized as follows:

1) General personal and social competence (item 8). In Group A the competence of 5 of the 6 children was considered satisfactory and concern was expressed about only one subject. In Group C two were judged satisfactory, concern was expressed about one and the competence of the fourth child was considered to be poor.

2) Adjustment to the class (item 1) and attitudes toward school, teachers, and school work (item 2) were considered above average or average for all subjects in both Groups A and C. No subject in either group was considered below average.

School Behavior Rating Scale. There were no statistically significant differences between these two small groups (A and C) on any of the dimensions

assessed by this measure.

Fifth Year in School (Grade 4)

Only one subject was available for study at this level. This was a PG Group B male subject who had attended the preschool for one year during the first year of the project.

A limited amount of data was obtained on this subject. He was given the Stanford Binet in the fall, but then became unavailable for further testing. This was because he became a resident at a local institute and attended school there. The institute had been counseling this subject's family and a temporary residential placement was approved, voluntarily, by his parent. Close to the end of the school year he was returned to his home and to his class in the public school, but it was too late to test him. However, in the fall of the next academic year, when this child was in Grade 5, a School Adjustment Report on him was obtained from his teacher.

At the beginning of Grade 4 this child's IQ was slightly above average, the same as it was at the end of preschool. The difference between his scores at these two times was only one IQ point. He was, however, because of absenteeism, performing academically at a low average level, especially in reading. At the Institute school, he made good progress and began to catch up and at the end of the year, when he returned to his public school class, he was promoted to Grade 5.

In the fall of his Grade 5 year, he was reported to be doing better academic work than before, especially in mathematics, but generally throughout the curriculum. He was said to be more mature emotionally and to be better adjusted to the classroom than before. He was still, however, receiving additional help from the Learning Resource teacher aimed at improving his reading comprehension and language abilities.

All Levels: Pass/Fail Rates

To calculate the overall failure rates for the samples, only those subjects who had been studied for at least two years in school were included. This was because no subject failed kindergarten and pass/failure at this level was not a discriminating variable.

Also, because the groups varied by number of subjects studied at the levels at which failure occurred (i.e., Grade 1 and above) the failure rate was calculated on the basis of the number of post-Kindergarten school years attended by each group. This procedure permitted the inclusion of subjects studied for one or two years and then lost. The calculations were as follows:

In Group A, 7 subjects were studied for 3 years at the Grade 1 level and beyond (7 x 3 = 21), 4 were studied for 2 years (4 x 2 = 8), and 12 for one year (12 x 1 = 12) for a total of 41 school years. Three failures occurred. The failure rate for this group, when calculated in this way was therefore 7.3%.

In Group B, one subject was studied for 4 years at the Grade 1 level and beyond, (1 x 4 = 4), one subject was studied for 2 years (1 x 2 = 2), and 5 subjects were studied for one year (5 x 1 = 5) for a total of 11 school years. One failure occurred. Thus, the failure rate for this group was 9.1%.

In Group C, 5 subjects were studied for 3 years at the Grade 1 level or beyond (5 x 3 = 15), 11 were studied for 2 years (11 x 2 = 22), and 6 were studied for one year (6 x 1 = 6) for a total of 43 school years. Ten failures occurred. The failure rate for this group was therefore 23.3%.

Thus, the failure rate in Group C was three times as great as in Group A and more than twice as great as it was in Group B.

The Grade levels attained by the subjects who were still in the project when it terminated and who had been studied at the Grade 1 level or above were as follows:

Group A (n = 22)	7 at grade level in Grade 4
	4 at grade level in Grade 3
	8 at grade level in Grade 2
	3 one year below grade level in Grade 1
Group B (n = 6)	1 at grade level in Grade 5
	4 at grade level in Grade 2
	1 one year below grade level in Grade 1
Group C (n = 20)	3 at grade level in Grade 4
	5 at grade level in Grade 3
	4 at grade level in Grade 2
	6 one year below grade level in Grade 1
	2 two years below grade level in Grade 1

Note that the attrition after Kindergarten was 2, 1, and 3 subjects in Groups A, B, and C respectively.

The percentage of subjects in each group who were at grade level at the end of the project was therefore 86.4%, 83.3%, and 60.0% in Groups A, B, and C respectively and it should be noted that 10% of the Group C subjects were as many as two years below grade level. Of these subjects, one has been enrolled in an opportunity class. In contrast, one of the Group A subjects has been enrolled in an accelerated class.

CHAPTER 3

Discussion of the Results of the Follow-up Study

1. Did the preschool graduates (PGs) maintain the intellectual and cognitive gains made by them in the preschool after they were enrolled in the primary grades?

The answer to this question is a resounding yes. The Binet IQs of the two PG groups did not decline during the course of the study. Instead they tended to increase over time with significant additional gains being made at the Kindergarten level. Even the sample of Group A subjects which was studied through four primary grade levels was found to have maintained its end of preschool IQ level throughout this whole time period. Also when, in the last project year, 16 of the PGs were tested by a stranger their IQ scores were not reduced.

Measures of cognitive competence, other than the Binet, were used only up to the end of Grade 1. These were the Circus tests. As measured by these tests the cognitive ability of the two PG groups continued to improve, at least in Kindergarten. At entry into Kindergarten their scores were still below average, but by the end of the year they were average. They then appeared to maintain these Kindergarten gains and again scored at an average level at the end of first grade.

2. Did the Control subjects without preschool experience "catch-up" to the PGs in intellectual and cognitive competence after entry into school at the Kindergarten or the higher grade levels?

Group C did not make IQ gains in Kindergarten which were as great as those made by the PG groups (A and B) during their preschool years. Group C did make a significant IQ gain in Kindergarten, but it was not any greater than the additional gains made by each of the two PG groups at this level. Thus Group C did not catch up to the PG groups on IQ.

The samples of Group C studied through one or two post-Kindergarten years maintained their end-of-Kindergarten IQ levels, but the sample studied for three years beyond Kindergarten showed, on last testing, a decline toward a level of functioning like that displayed on entry into Kindergarten.

The cognitive competence of Group C, as measured by the Preschool Inventory and the Circus tests, did however improve significantly, relative to the two PG groups, during Kindergarten and first grade. At both the beginning and end of Kindergarten, the two PG groups obtained higher scores than Group C, but at the end of the year the differences between Group C and each of the two PG groups on one measure (functional language) were no longer significant. Also, by the end of Grade 1, none of the differences among the three groups on any of the Circus measures were large enough to be statistically reliable. Although this latter finding suggests that Group C had "caught up" to the PG groups the differences between them on two measures (Circus "Think it Through" and "How Much and How Many") were still large enough to be meaningful. When evaluated against the available normative data (US National Means), the scores of the PG groups were average, but those of Group C were generally below average. However, it is noteworthy that on Circus "Say and Tell", the language measure, Group C (as well as Groups A and B) was performing, on most items, at an average level.

Tests like the Stanford Binet and the Circus tests, especially the former, are often referred to as aptitude tests or tests which can be used to predict, for example, academic achievement. The results obtained here with these tests are in marked contrast to those reported in most other compensatory preschool studies (Bronfenbrenner, 1974), with only one or two exceptions (Karnes, 1973; Weikart et al., 1978). In most cases there has been a gradual attenuation of preschool IQ gains and gains made on other types of aptitude tests during the primary grades and the differences between the preschool graduates and their controls have completely disappeared.

With respect to the Control group it is of interest to note that Weikart et al. (1978) obtained results similar to those found in this study. The gain in the Binet IQ of his Control group from entry into Kindergarten to the end of first grade, was 3.8 points. However, by the end of fourth grade this school effect was no longer evident.

3. Was the academic achievement of the PGs superior to that of the "Controls" and did they "fail a year" less often?

The answer to this question is also yes! At all levels the academic achievement test scores of both Groups A and B were higher than those of Group C, although the size of the differences were not always statistically significant, especially those between Groups B and C. This was because the sample of Group B subjects was so small. The reader may have noticed that on some tests the difference between the mean scores of Groups A and B was not significant, but Group A's score (and not Group B's score) was significantly higher than Group C's score even when, as was sometimes the case, Group B's mean score was slightly higher than Group A's score.

It was difficult to assess the strengths and weaknesses of the groups by academic area because no Canadian normative data were available and the use that was made of normative data from the United States for this purpose may have been misleading. What children achieve in school is a function of what they are taught as well as their aptitude for learning, motivation and work habits. For example, at the Grade 3 level none of the groups made significant gains on the Science and Social Studies test in the Stanford Achievement Primary II Battery, suggesting that what was measured by this test may not have been emphasized in the London schools in Grade 3. In so far as the use of American norms was appropriate, the pattern of performance was not entirely consistent from level to level. However, the preschool graduates seemed to, by and large, do somewhat better on language and other reading-related tests than on ones which assessed other types of academic ability.

As judged by teachers the academic competence of Group A (with two years of preschool experience) was clearly superior to that of Group C (the Control group), but the teachers tended to underestimate the actual academic ability of Group B (with only one year in preschool) and to judge this group to be not much more competent than Group C. However, the pass/fail rate in Group B was just about as satisfactory as it was in Group A.

Being promoted is a global criterion of satisfactory academic achievement, but is probably the most meaningful one in this study. On this criterion the two PG groups were clearly superior to the Control group. The failure rate in Group C was three times greater than in Group A and more than twice as great as in Group B and, by the end of the project, 86% of Group A, 83% of Group B but only 60% of Group C were at an appropriate grade level and 10% of Group C were as many as two years below grade level.

4. Did the PG's adjust better to school, have better attitudes and study habits, display more appropriate classroom behavior and seem better adjusted personally and socially than the Controls?

No firm answer to this question could be obtained from the available data. This was probably due partly to the subjective nature of the measures employed (teacher judgments), and partly to variability in the standards against which the children were judged across the many different schools in which they were enrolled. These variables may account for why the Behavior Rating Scale failed to differentiate the groups successfully on any of the dimensions assessed at the post-Kindergarten levels. The information provided by the teachers in response to the more open-ended questions in the School Adjustment Report suggested that there were important differences between at least Groups A and C in the way in which they

adjusted to school, but in the Behavior Rating Scale data these differences were reflected (when reflected at all) in only trends in the expected direction.

In spite of the questionable reliability of the findings with the Behavior Rating Scale some of the trends in the data were consistent over time. The repeated replication of trends is an alternative method of assessing their reliability which some claim is more appropriate in educational research, with small samples, than tests of statistical significance (Carver, 1978). There were two trends which may be meaningful. The first was the difference between the PGs and the Controls on External Control, a difference which was significant at the Kindergarten level, replicated for both Groups A and B at the grade 1 level and for the samples of Group A studied at the higher levels. One of the goals of the preschool was self reliance or self direction and these findings suggest that this goal may have been achieved in the long, as well as the short range. However, the tendency to make independent decisions, to rely less on teachers for direction and to be less swayed by the opinions of others may have made these children less, rather than more attractive to teachers, as has been found by other investigators (Feshbach, 1969; Helton & Oakland, 1977).

The second consistent trend was for the teachers to rate Group B as low or sometimes even lower than Group C and to rate Group A higher than either of the other two groups. This trend, which favoured the Group A subjects was consistent with the data obtained from the responses to the School Adjustment Report. Thus, it is probably fair to conclude that the Group A subjects, with two years of preschool experience, made on the average, better social and personal adjustments in school than did those with only one year of preschool (Group B) or those without any preschool experience (Group C).

The finding that the Group B subjects with only one year of preschool experience did not adjust to school any better than the Controls with no preschool experience

must, however, be interpreted with great caution. It must be remembered that Group B was very small and may not have been truly representative. Also there were proportionately more boys in this group than in either of the other two groups. Boys tend to conform less readily in the classroom and the judgments of teachers on a variety of measures have been found to be more adversely affected by how non-compliant a child is than by any other variable (Kohn & Rosman, 1972).

5. Were the children who had two years of preschool experience starting at age 3 more successful in school than those who had only one year starting at age 4?

In general, the answer to this question is a very cautious yes, because the academic achievement of the Group B subjects, as measured by the objective tests and the pass/fail rates, was more often than not just about as satisfactory as that of Group A. The Group B subjects seemed to benefit from their first year in preschool in much the same way as had the Group A subjects. Following it they made summer holiday intellectual and cognitive gains and then in Kindergarten continued to grow in these areas in much the same way as had the Group A subjects in their second preschool year. Thus, by the end of Kindergarten, Group B had caught up to Group A in many respects. Group B may, however, have been aided in this by having somewhat more genetic potential than Group A. As the amount of early education obtained by Group B increased, its mean IQ also gradually increased, and at the last testing time when all 12 subjects were assessed (beginning of Grade 1) it was 109 when Group A's mean, for the total group of 24, appeared to have stabilized at 104.

As has been reported above, the teachers found the Group B subjects to be less satisfactory pupils from a behavioral point of view than the Group A subjects, and considered them to be in as much need of special instruction as the Group C control subjects. However, in the end, at least as far in school as this study followed the Group B subjects, the teachers promoted them just about as frequently as they promoted the Group A subjects.

Summary

This discussion has dealt with only the follow-up results and has not related them in any detail to the findings which were obtained about the immediate impact of the preschool program on the development of the children. Therefore, this chapter is incomplete and will be expanded when Part 1 of Section II of the final book-length report is prepared. A report on the immediate impact of the program on Group A may be found in Research Bulletin #431 (Wright, 1978), which also provides a detailed description of the Group A subjects, and how they were obtained.

Although the sizes of the samples available for study in the follow-up were not large, certain aspects of the project strengthened it and support the assumption of validity for the findings. The first and most important of these was the opportunity to study a substantial number of the children for as many as four years after they entered the elementary school and to be able to show that the main findings were replicated at each of four primary grade levels. Second, it was possible to study all but a very few of the subjects during the most critical years, i.e., the first two years in the primary grades. These years were critical in the sense that, in almost all studies of compensatory preschool programs, it has been found that the immediate effects of them, as measured by tests of academic aptitude, such as IQ and even school achievement, have disappeared.

Regarding the benefits of only one, as compared with two years of preschool, these findings permit only tentative conclusions. They strongly suggest, however, that only one year may not prepare low-income children to meet the social and behavioral expectations and values of the school, but may be almost as effective as two years in preschool in helping them develop their intellectual and cognitive potential and the ability to cope more successfully with academic work.

In conclusion, therefore, the findings of the follow-up study strongly support the view that early education for children from low-income families can significantly diminish their risk of failing in school and reduce the cost of their education by eliminating their need for placement in special classes and by reducing their need for other kinds of special remedial instruction. The long range benefits of this for the children, their families, and society as a whole should be substantial.

The results also suggest that the assumptions made about the needs of low-income children in a moderate sized Canadian city such as London, Ontario and the type of stimulation they require in an early education program, were valid and that the program designed for them in the Laboratory Preschool at Western was appropriate. The program and its development will be described in detail in Section I of the final book-length report which is in preparation. A preliminary report on the development of the program may be found in Research Bulletin #355 (Wright, 1976).

One final word about the overall results of the project may be of considerable interest to Canadian early childhood educators who have designed compensatory programs on the basis of conclusions drawn from the findings of Head Start research in the United States. This has to do with language. In the United States the focus of Head Start has more often than not been on the development of language skills. In Canada this may not be appropriate, certainly not in areas where a common language is spoken and there are no dialects. The smallest differences on cognitive-related measures, found between the low- and high-income children studied in the preschool, were on the language tests and, as has been reported here, the first, and essentially the only differences between the PGs and Controls which were eliminated after entry into Kindergarten were those in the language areas.

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